

**AECOM**

**Burney Compressor Station**

**K-2 Replacement Project**

**Report on Delay**

Case 1:20-cv-02387-HSC Document 550-3 Filed 04/15/21 Page 1 of 145

By:  
Ted Scott  
18 October 2021

|          |  |            |
|----------|--|------------|
| <b>1</b> | <b>Executive Summary .....</b>   | <b>3</b>   |
|          | <i>Phase 1 (Engineering).....</i>  | <i>4</i>   |
|          | <i>Phase 2 (Construction).....</i>   | <i>9</i>   |
|          | <i>Phase 3 (Commissioning).....</i>  | <i>12</i>  |
|          | <i>Overall Conclusion .....</i>  | <i>14</i>  |
| <b>2</b> | <b>Introduction .....</b>  | <b>16</b>  |
|          | <i>Author of this report.....</i>  | <i>16</i>  |
|          | <i>Instructions .....</i>  | <i>16</i>  |
|          | <i>Documents Reviewed .....</i>  | <i>16</i>  |
|          | <i>Key Project Personnel .....</i>   | <i>17</i>  |
|          | <i>Structure of the Report.....</i>  | <i>17</i>  |
| <b>3</b> | <b>Project Background .....</b>  | <b>19</b>  |
| <b>4</b> | <b>Methodology .....</b>   | <b>27</b>  |
|          | <i>The As-Planned vs. As-Built Analysis .....</i>  | <i>30</i>  |
|          | <i>The Baseline Schedules.....</i>   | <i>31</i>  |
|          | <i>The Actual Critical Path .....</i>  | <i>32</i>  |
| <b>5</b> | <b>Analysis of Delay to Design (Phase 1) .....</b>   | <b>33</b>  |
|          | <i>Phase 1 Window I – Partial Completion of Phase 1 (11 Feb 2016 to 15 Jan 2017) .....</i>         | <i>34</i>  |
|          | <i>Phase 1 Window II – Full Completion of Phase 1 (16 Jan 2017 to 15 Nov 2017) .....</i>           | <i>47</i>  |
|          | <i>Conclusions of Analysis of Delay to Phase 1 Design .....</i>                                    | <i>58</i>  |
| <b>6</b> | <b>Analysis of Delay to Construction (Phase 2).....</b>  | <b>59</b>  |
|          | <i>The Planned Sequence of Construction .....</i>  | <i>59</i>  |
|          | <i>The Actual Sequence of Construction .....</i>   | <i>62</i>  |
|          | <i>Periods of Performance .....</i>  | <i>64</i>  |
|          | <i>Phase 2 Window I – Start of the UG Conduit for the Aux Bldg. (17 Oct 2016 to 1 Jun 2017)...</i> | <i>66</i>  |
|          | <i>Phase 2 Window II – UG Conduit Installation (1 Jun 2017 to 17 Jul 2017).....</i>                | <i>76</i>  |
|          | <i>Phase 2 Window III – Installation of UG Duct Banks (18 Jul 2017 to 16 Dec 2017) .....</i>       | <i>88</i>  |
|          | <i>Phase 2 Window IV – Terminations and Testing (16 Dec 2017 to 2 Feb 2018).....</i>               | <i>97</i>  |
|          | <i>Conclusion of Analysis of Delay to Construction.....</i>  | <i>101</i> |
| <b>7</b> | <b>Analysis of Delay to Commissioning .....</b>  | <b>102</b> |
|          | <i>The Planned Sequence of Commissioning .....</i>   | <i>102</i> |

|   |            |
|---|------------|
| <i>The Actual Sequence of Commissioning .....</i>   | <i>105</i> |
| <i>Periods of Performance .....</i>   | <i>108</i> |
| <i>Phase 3 Window I – PG&amp;E Tie-Ins (2 Feb 2018 to 25 Feb 2018).....</i>                     | <i>109</i> |
| <i>Phase 3 Window II – Soap Test (25 Feb 2018 to 6 Mar 2018).....</i>                           | <i>113</i> |
| <i>Phase 3 Window III – Turnover of Main Gas (6 Mar 2018 to 7 Apr 2018) .....</i>               | <i>118</i> |
| <i>Phase 3 Window IV – Completion of Static ESD Test (7 Apr 2018 to 12 Apr 2018).....</i>       | <i>122</i> |
| <i>Phase 3 Window V – Gas-In for Initial Commissioning Runs (12 Apr 2018 to 18 Apr 2018) ..</i> | <i>125</i> |
| <i>Phase 3 Window VI –Initial Commissioning Runs (18 Apr 2018 to 13 May 2018) .....</i>         | <i>129</i> |
| <i>Phase 3 Window VII –Completion of 100-Hour Test (13 May 2018 to 26 May 2018).....</i>        | <i>134</i> |
| <i>Phase 3 Window VIII – Substantial Completion (26 May 2018 to 6 Jun 2018).....</i>            | <i>139</i> |
| <i>Conclusion of Analysis for Commissioning and Substantial Completion .....</i>                | <i>141</i> |
| <b>8 Appendix A – Curriculum Vitae of Ted Scott .....</b>                                       | <b>142</b> |

## 1 Executive Summary

- 1.1 On 11 February 2016, AECOM Technical Services (“AECOM”) entered into an agreement with Pacific Gas and Electric Company (“PG&E”) for the amount of \$40,510,262 to perform all engineering, procurement and construction services required to complete the Burney K2 Replacement Project (“the Project”) at the Burney Compressor Station.<sup>1</sup>
- 1.2 AECOM later entered into a subcontract with JH Kelly for the Phase 2 Construction of the Project at a lump sum price of \$14,341,281.00.<sup>2</sup>
- 1.3 Contractually, the Project was divided into two Phases: with Phase 1 being the time to complete the Engineering of the Project and Phase 2 being for the time to complete the Construction of the Project. According to the Contract, the phases were to be performed sequentially. In other words, Phase 1 was planned to be finished before Phase 2 could commence.
- 1.4 As will be discussed herein, both phases were substantially delayed such that Phase 1 was not Substantially Complete until 5 November 2017 (373 days later than planned) and Phase 2 was not Substantially Complete until 5 June 2018 (201 days later than planned). As will be discussed, part of the delay was due to the fact that Phase 1 was not complete when Phase 2 commenced, so the phases overlapped.
- 1.5 Due to the above delays, I have been retained to independently identify and quantify the cause(s) of delay each phase. While the assessment of responsibility for the delay is ultimately for the Trier of Fact to decide, I have attempted to assist based on my understanding of the various issues.
- 1.6 In performing my assessment, I utilized the “As-Planned vs As-Built Windows” methodology to analyze the delay incurred as, in my opinion, it was the only suitable approach given the condition of the schedules that were submitted during the course of construction. Indeed, one advantage of the “As-Planned vs As-Built Windows” methodology is that it can be performed with less-than-ideal schedule data (i.e., a fully functional baseline is not necessary). The analyst can simply use the baseline schedule as it is found, subjective modifications are not required. As a result, the methodology focuses more directly on the as-built critical path so the Trier of Fact can evaluate all

---

<sup>1</sup> [BURNEY000075174-BURNEY000075179] FE CCP AECOM 2501335149 02112016 Final fpd3.pdf

<sup>2</sup> [AEC01036572] JH Kelly CONTRACT 60482831-SC-001\_2016-10-21\_Fully Executed.pdf

the facts and opinions that lead to that path. The focus can remain on what actually happened, as opposed to modelled events predicting what might happen (i.e., theoretical or prospective analysis).

- 1.7 My analysis for the different phases is summarized below. I note that contractually, Phase 2 included both Construction and Commissioning. However, for ease of discussion, I have separated Commissioning into its own phase (Phase 3).

### **Phase 1 (Engineering)**

- 1.8 Phase 1 of the Project included the Engineering design of the Project and my analysis of this phase is detailed in Section 5 of this report.
- 1.9 From the outset of the Project and even during the Project Kick-off meeting, PG&E knew that the initial 30% design included within the RFP for the Project would need to be revised. As will be discussed below, these known changes to the design (the majority of which were related to the electrical work), ultimately delayed the completion of Phase 1 such that it was not completed until 15 November 2017 – **373 days later than planned**.<sup>3</sup>
- 1.10 According to the Contract, the Engineering of the Project (i.e., Phase 1) was divided into interim milestones for the 30%, 60%, 90% and 100% IFC design reviews.
- 1.11 In accordance with the Contract Milestone Schedule, AECOM and PG&E conducted the 30% design review on 5 May 2016. However, during the review, several design changes were discussed which essentially caused AECOM to have to go back to the drawing board and start again.<sup>4</sup>
- 1.12 In the months following the 30% design review meeting, I understand that PG&E (via its Engineer Mr. Malsen) requested several more changes which triggered a significant redesign effort by AECOM.<sup>5</sup>
- 1.13 On 31 August 2016, due to the above changes, AECOM finally submitted the 60% design review - **69 days later than planned** (31 August 2016 - 23 June 2016 = 69 days).<sup>6</sup>
- 1.14 In line with the delay already incurred, AECOM submitted the 90% design documents such that the review meeting was held on 2 November 2016 – **69 days later than planned** (2 November 2016 – 25

---

<sup>3</sup> [AEC00058072-AEC00058100] See AECOM Change Order 4

<sup>4</sup> [AEC00998801-10] 5/5/16 Meeting Minutes.

<sup>5</sup> Dean Goward deposition page 43

<sup>6</sup> [AEC00720828-AEC00720834] 8-31-16\_BURNEY\_K2\_MINUTES\_FINAL

August 2016 = 69 days).<sup>7</sup> In other words, AECOM did not incur any further delay between the 60% and 90% drawing reviews.

- 1.15 After the 90% design review meeting, AECOM was able to continue to progress the design of the various engineering disciplines (i.e., Civil, Structural, Mechanical) with the exception of the Electrical design which was placed on hold as it was dependent on PG&E making decisions regarding major electrical equipment.<sup>8</sup>
- 1.16 While AECOM waited for PG&E to make its electrical equipment decisions (so that they in turn could finish the Electrical design), AECOM submitted the 100% stamped IFC drawings for all other design packages (except for Electrical and Fire Suppression). These submissions were approved on 15 January 2017.<sup>9</sup>
- 1.17 Given the planned completion for Phase 1 in the Contract (i.e., 7 November 2017), partial Substantial Completion for Phase 1 was achieved **69 days later than planned** (15 January 2017 – 7 November 2016 = 69 days).<sup>10</sup> Again, with the exception of the Electrical design, AECOM did not incur any further delay between the 90% and 100% IFC drawing reviews.
- 1.18 After receiving PG&E's electrical equipment decisions, AECOM issued an un-stamped electrical IFC package on 24 February 2017.<sup>11</sup> However, during the review of these IFC drawings, PG&E noted that they were still making changes to the design. It is also my understanding that a conflict between the proposed duct bank and an existing utility line was discovered at this time.<sup>12</sup>
- 1.19 To expedite the implementation of PG&E's changes post the 100% AECOM submittal, PG&E's Mr. Maslen located himself in AECOM's Oakland offices between March 2017 and May 2017.<sup>13</sup> While he was there, he changed the basis of design for the wire and conduit which required a complete redesign and redrawing of the Project to an entirely new design criteria.<sup>14</sup>

[Case 4:20-cv-02381-HSC Document 550-3 Filed 04/11/25 Page 6 of 145](#)

<sup>7</sup> See As-Built Schedule Activity ID: BCS.165 "90% Design Review"

<sup>8</sup> [BURNEY000121170] 2016-11-22\_BURNEY\_K2\_MEETING\_MINUTES

<sup>9</sup> [BURNEY000081791-BURNEY000081810] AECOM January 2017 Monthly Report

<sup>10</sup> See As-Built Schedule Activity ID: BCS.180 "Engineering Completion"

<sup>11</sup> See Dean Goward deposition Exhibit 66

<sup>12</sup> The conflict between the duct bank and gas line were actually shown on the 30%, 60% and 90% drawings, but neither JH Kelly nor PG&E noted the requirement to alter the duct bank routing to resolve this conflict until the 100% drawings were submitted. See Goward Deposition, Exhibits 62, 63, and 64.

<sup>13</sup> See Goward Deposition page 85

<sup>14</sup> See Goward Deposition page 85

- 1.20 I understand from discussions with Mr. Lewis, that this new design criteria was a fundamental change which should have been included in the RFP project requirements and was not due to Code requirements. In other words. It was a preferential change that PG&E wanted to make. It is also my understanding that it had the following implications:
- a) Shifting the majority of the above ground conduit into duct banks below ground;
  - b) Changing large conduit with multiple conductors to small conduit with single conductors;
  - c) Changing the ambient temperature at which the wire was to perform;
  - d) Changing conduit spacing requirements;
  - e) both changes “c” and “d” caused an increase in quantity for wire, conduit, and duct bank excavation;
  - f) Increasing the depth of conduit below the Auxiliary Building; and
  - g) Eliminating the below grade wire access points and replacing those with above ground stainless steel pull boxes for the underground duct bank.
- 1.21 In an effort to mitigate the on-going delay to the Electrical design (and the knock-on impact it had to the construction work), AECOM issued the drawings in a piecemeal fashion to allow construction to commence.<sup>15</sup> To that end, AECOM was able to issue the IFC Conduit layout on 5 May 2017 which allowed the excavation work to commence on site.<sup>16</sup>
- 1.22 In my opinion, the **70-day delay** to the late issuance of the IFC Conduit drawing (between 24 February 2017 and 5 May 2017) is attributable to both PG&E’s preferential design changes as well as the need to reroute the duct bank around the existing utility conflict. Should it be found that JH Kelly was responsible for catching the conflict earlier than they did, then they would share accountability for the delay. For purposes of this report, I assumed this to be the case and have split the delay equally between the two parties (i.e., 35 days to PG&E and 35 days to JH Kelly).
- 1.23 As it turns out, AECOM did not issue the last IFC package until 15 November 2017 – **373 days later** Case 3:20-cv-02387-HSC Document 550-3 Filed 04/15/25 Page 1 of 145 **than planned**. I have determined this date to be when full Substantial Completion of Phase 1 was achieved. In my opinion, the remaining delay was due to issues contained in PG&E’s preferential changes to the Electrical design criteria that were made after the original IFC submission.
- 1.24 I have summarized the Phase 1 delay in the table below.

---

<sup>15</sup> Dean Goward Deposition page 86-87

<sup>16</sup> See Goward Deposition Exhibit 67

| Phase 1 Window | Delay Description  | PG&E | JHK | AECOM | Exc. Non-Comp | Cumulative Delay |
|----------------|--|------|-----|-------|---------------|------------------|
| I              | Changes to PG&E's Bid Design   | 69   | 0   | 0     | 0             | 69               |
| II             | PG&E's Preferential Change and the conflict between the duct bank and the existing utility | 269  | 35  | 0     | 0             | 373              |
| Total          |  | 338  | 35  | 0     | 0             |                  |

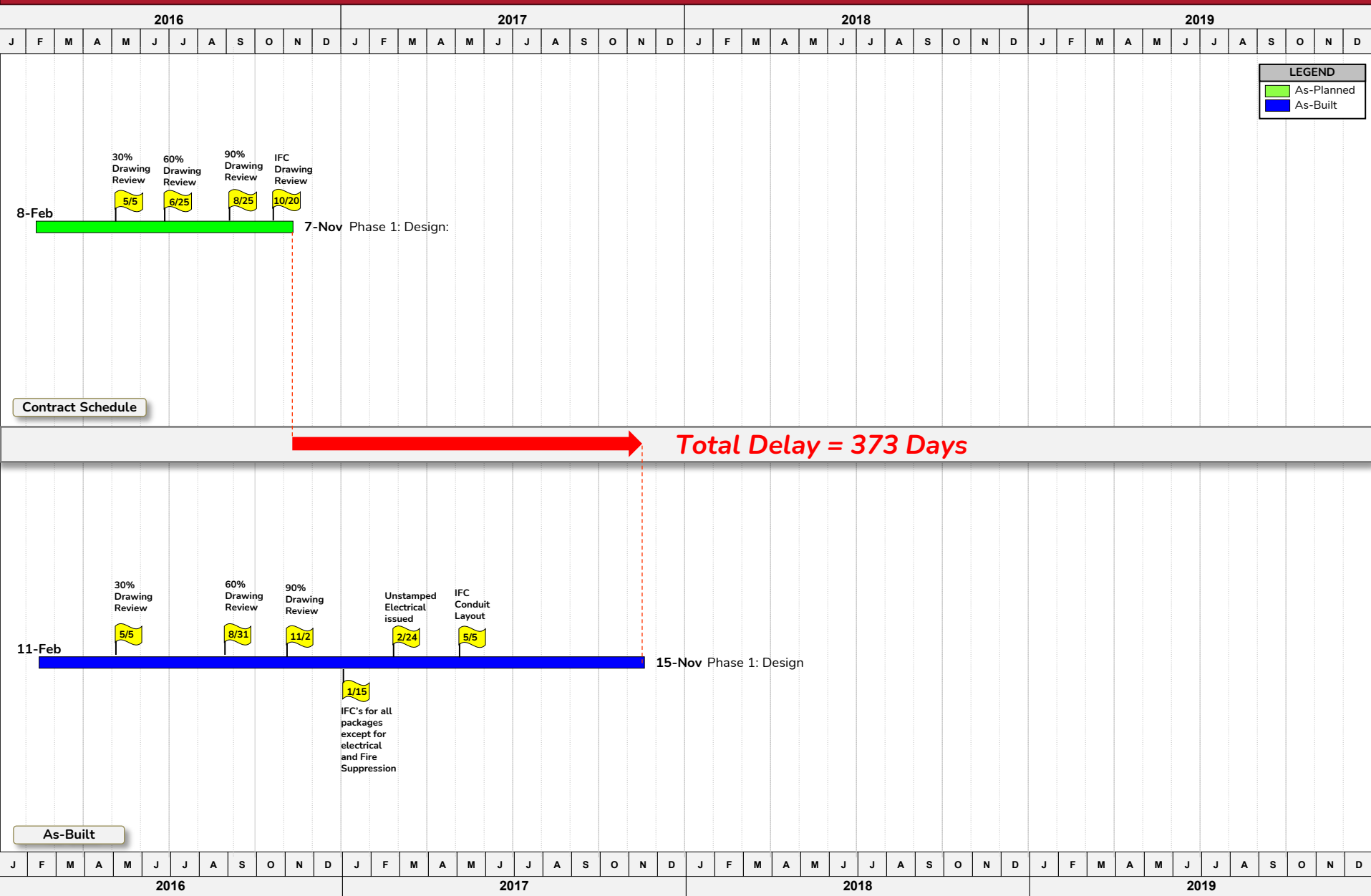
1.25 The performance during this time period is also illustrated in Figure 1-1 on the following page.

# Burney Compressor Station K-2 Replacement Project

## Phase 1 Summary

Case 4:20-cv-05381-HSG Document 220-3 Filed 04/21/22 Page 9 of 142

Figure 1-1



### Phase 2 (Construction)

- 1.26 The Construction phase of the Project (i.e., Phase 2) is detailed in Section 6 of this report and covers the period between 17 October 2016 and 2 February 2018.
- 1.27 On 6 March 2017, while PG&E continued to make the changes to the Electrical design, JH Kelly and AECOM field staff mobilized to site for Phase 2 construction work.<sup>17</sup> The next day, on 7 March 2017, JH Kelly's earthworks subcontractor (Meyers) also mobilized to site.<sup>18</sup> Meyers in fact commenced the excavation for the Compressor pad on 13 March 2017.
- 1.28 While JK Kelly could commence the excavation work, they could not commence the installation of the underground conduit as they were still waiting on the IFC Conduit drawings.
- 1.29 As it turns out, due to PG&E's new design as well as the discovery of a conflict between the proposed duct bank and the existing utility line, AECOM was not able to issue the IFC Conduit layout for the critical Auxiliary Building until 5 May 2017.<sup>19</sup> With the approved drawing, JH Kelly could finally commence prefabricating the underground conduit for the Auxiliary Building.
- 1.30 According to the as-built record, the first delivery of conduit for the Auxiliary Building arrived on 1 June 2017 and was immediately installed – **64 days later than planned**.<sup>20</sup> For purposes of this report, I assumed this delay to be shared between PG&E and JH Kelly and again have split the responsibility equally (i.e., 32 days to PG&E and 32 days to JH Kelly).
- 1.31 Upon commencing the excavations for underground conduit work at the Auxiliary Building, JH Kelly took longer than planned to complete this work. Based upon my review of the Project records, it is my opinion that this extended duration was due to the discovery of boulders during excavation, the additional scope from PG&E's change in design, and JH Kelly's slower than planned progress. Due to these delays, JH Kelly did not complete the underground conduit for the Auxiliary Building until 17 July 2017 – **105 days later than planned**.<sup>21</sup>

C926 4:50-CA-02387-H2C Document 550-3 Filed 04/15/25 Page 10 of 15

- 1.32 Once the underground conduit was complete within the Auxiliary building, JH Kelly continued to make good progress in the Auxiliary building structure. However, despite this good progress in the

---

<sup>17</sup> [BURNEY000081842] See March 2017 Monthly Report page 13

<sup>18</sup> [BURNEY000081842] See March 2017 Monthly Report page 13

<sup>19</sup> See Goward Deposition Exhibit 67

<sup>20</sup> [JHK\_BURNEY\_00337166-JHK\_BURNEY\_00337167] JH Kelly Daily Report of 1 June 2017

<sup>21</sup> See As-Built Schedule Activity ID "ELEC00090" Excavate/Install UG Conduit for MCC - Auxiliary Building"

Auxiliary Building, JH Kelly was delayed in other areas of the Project, namely the duct banks. As it turns out, JH Kelly was unable to progress the electrical duct banks as planned and this work subsequently delayed the commencement of terminations in the Auxiliary Building until 16 December 2017 – **130 days later than planned.**<sup>22</sup>

- 1.33 After commencing terminations, the parties agreed to shut down the Project for a period of 12 days over the holidays.
- 1.34 Upon returning, JH Kelly continued the termination and testing works in the Auxiliary Building. Although JH Kelly added shifts for this electrical work, they still performed this work slower than planned. As a result, they were only 30% complete with this work when the critical path shifted into Commissioning on 2 February 2018 – **150 days later than planned.**
- 1.35 I have summarized the Phase 2 delay in the table below. The performance during this time period is also illustrated in Figure 1-2 on the following page.

| Phase 2 Window | Delay Description  | PG&E | JHK | AECOM | Exc. Non-Comp | Cumulative Delay |
|----------------|--|------|-----|-------|---------------|------------------|
| I              | PG&E's Preferential Changes to the Electrical Design and the conflict between the duct bank and the existing utility | 32   | 32  | 0     | 0             | 64               |
| II             | Boulder Excavation   | 7    | 0   | 0     | 0             | 71               |
| II             | Increased underground conduit as a result of PG&E's preferential electrical changes                                  | 19   | 0   | 0     | 0             | 90               |
| II             | Slower than planned progress installing the underground conduit underneath the Auxiliary Building                    | 0    | 15  | 0     | 0             | 105              |
| III            | Additional and increased duct banks as a result of PG&E's preferential electrical changes                            | 19   | 0   | 0     | 0             | 124              |
| III            | 4" Gas Line Damage   | 0    | 6   | 0     | 0             | 130              |
| IV             | Agreed Project Shut Down   | 0    | 0   | 0     | 12            | 142              |
| IV             | Slower than planned progress Pulling Wire and Performing Terminations  | 0    | 8   | 0     | 0             | 150              |
| Total          |  | 77   | 61  | 0     | 12            | 150              |

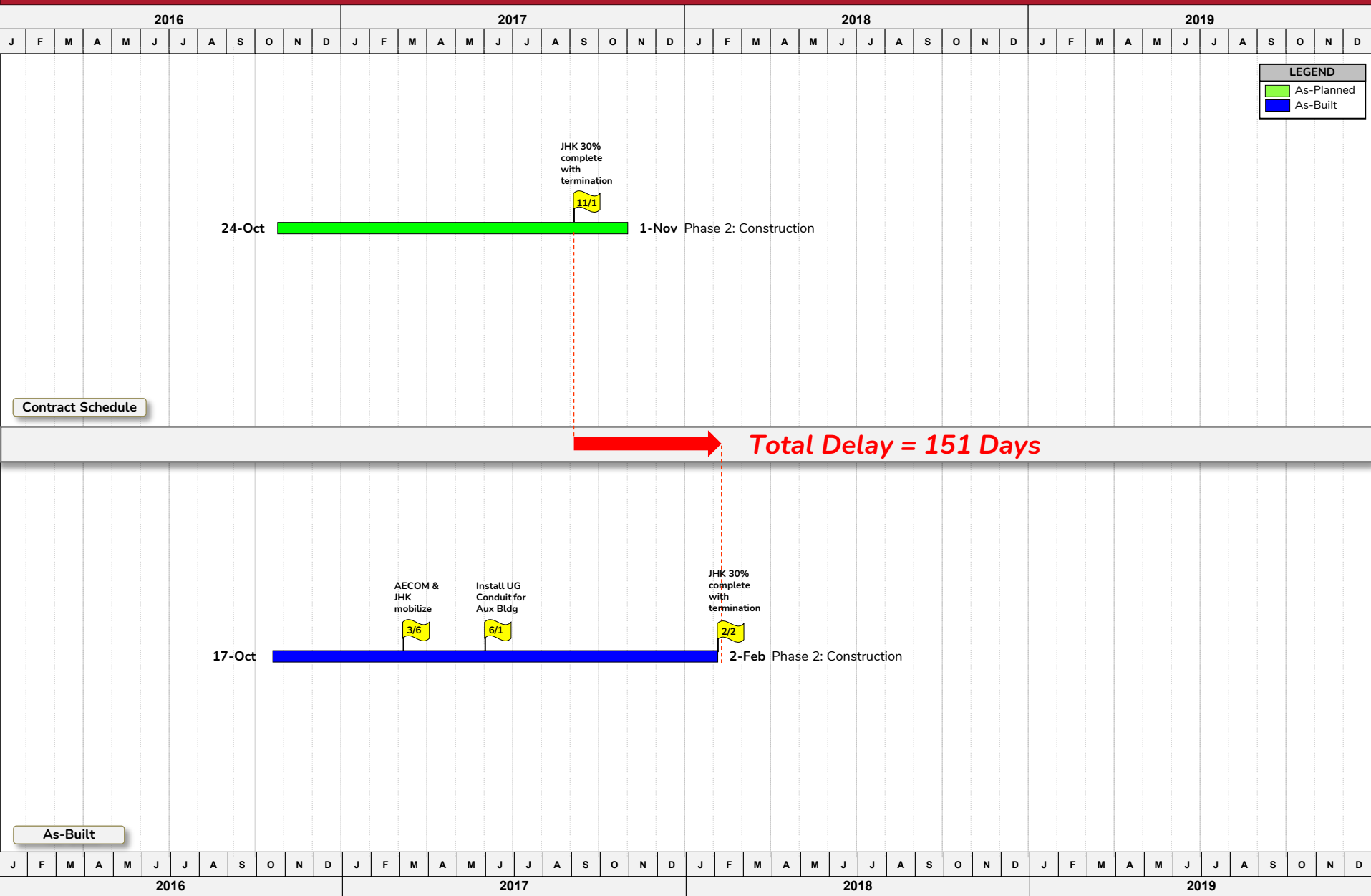
<sup>22</sup> [JHK\_BURNEY\_00167348-JHK\_BURNEY\_00167354] See JH Kelly Daily Report of 16 December 2017

# Burney Compressor Station K-2 Replacement Project

## Phase 2 Summary

Case 4:20-cv-05381-HSG Document 220-3 Filed 04/21/22 Page 12 of 142

Figure 1-2



**Phase 3 (Commissioning)**

- 1.36 Section 7 of this report details the third time period of my analysis which is for the Commissioning Phase of the Project (i.e., Phase 3) and covers the period between 2 February 2018 and 6 June 2018.
- 1.37 While JH Kelly was progressing the electrical works within the Auxiliary Building with added shifts and overtime, AECOM could not progress the main gas testing and commissioning until PG&E completed its tie-ins. These tie-ins connected the new Project piping into the existing utilities.
- 1.38 Due to a number of revisions to the Burney Tap tie-in spool, PG&E did not complete its tie-ins until 25 February 2018<sup>23</sup> – **10 days later than planned in the Commissioning Schedule** (25 February 2018 – 15 February 2018 = 10 days).
- 1.39 While the tie-ins were being delayed, the electrical work progressed as planned. In fact, permanent power was achieved on 27 February 2018 as planned.<sup>24</sup>
- 1.40 Once the main gas tie-ins were completed, AECOM performed the Soap test to ensure that there were no gas leaks through the new connection.<sup>25</sup>
- 1.41 Upon completing the Soap test, AECOM completed the main gas turnover packages which were required to begin the static Emergency Shut Down (ESD) test. The ESD system is designed to safely discharge gas in the event of an emergency.
- 1.42 The Static ESD test started on 7 April and was planned to take 1 day. However, due to problems with the new fire suppression program, the test was not completed until 12 April 2018 – **20 days later than planned in the Commissioning Schedule**.<sup>26</sup>
- 1.43 Once the static ESD test was completed, AECOM planned to bring gas into the station for initial commissioning runs. However, on 13 April 2018, the ESD system recorded a fault signal from the Programmable Logic Controller (“PLC”) network which resulted in gas being discharged.<sup>27</sup> After

C926 4:50-CA-02387-H2C Document 550-3 Filed 04/15/22 Page 13 of 145

---

<sup>23</sup> [JHK\_BURNEY\_00171240-JHK\_BURNEY\_00171241 (Feb 19), JHK\_BURNEY\_00169251-JHK\_BURNEY\_00169252 (Feb 25)] JH Kelly Daily Report of 19 and 25 February 2018

<sup>24</sup> See As-Built Schedule Activity ID BCS.800 “Permanent Power In to the Station”

<sup>25</sup> See As-Built Schedule Activity ID BCS.910 “Soap and Pressure Test after Tie-In”

<sup>26</sup> See As-Built Schedule Activity ID COMM-70 “Perform Static ESD test”

<sup>27</sup> [AEC00785331-AEC00785334 (entire doc), AEC00785331 (B), AEC00785333 (IV)] See AECOM Commissioning Plan of the Day for 14-Apr-18 section B and IV

troubleshooting the system, a “mask” was put in place as a temporary fix to allow gas commissioning to proceed.<sup>28</sup>

- 1.44 On 18 April 2018, with the “mask” mitigation measure in place, gas was brought in for the initial commissioning runs (**25 days later than planned in the Commissioning Schedule**).<sup>29</sup>
- 1.45 With gas in the system, AECOM planned to perform the initial commissioning runs. However, due to a number of issues (including a problem with the generator wire harness and a damaged “witches’ hat” strainer) the 100-hour performance test was not performed until 13 May 2018 - **43 days later than planned in the Commissioning Schedule**.<sup>30</sup>
- 1.46 After commencing, the 100-hour performance test was interrupted on 15 May 2018 due to a power outage.<sup>31</sup> As will be discussed, it was not until 22 May 2018, that AECOM could resume the 100 hour and 10-day performance tests.<sup>32</sup>
- 1.47 Once testing was resumed, AECOM was able to complete the performance tests of the Compressor unit and achieve Substantial Completion on 6 June 2018 (**51 days later than planned in the Commissioning Schedule**).<sup>33</sup>
- 1.48 An additional 51 days of delay were incurred during the commissioning for Substantial Completion which was achieved on 6 June 2018 – 201 days late. This delay can be seen in the table below. I have summarized the Phase 3 delay in the table below.

[Case 4:20-cv-02387-H2C Document 550-3 Filed 04/15/22 Page 14 of 145](#)

<sup>28</sup> [BURNEY000377900] See AECOM April 2018 monthly report page 23

<sup>29</sup> [AEC00459957-AEC00459960 and AEC00390312-AEC00390315, AEC00459957 (4/18 sect I), AEC00390312 (4/19 sect. I)] See AECOM Commissioning Plan of the Day for 18 and 19-Apr-18 section I

<sup>30</sup> [AEC00394617-AEC00394620 (entire doc), AEC00394618 (K)] See AECOM Commissioning Plan of the Day for 14-May-18 section K

<sup>31</sup> [AEC00329747-AEC00329750, AEC00329748 (K)] See AECOM Commissioning Plan of the Day for 16-May-18 section K

<sup>32</sup> [AEC00373571-AEC00373573, AEC00373572 (sect VII)] See AECOM Commissioning Plan of the Day for 22-May-18 section VII

<sup>33</sup> [AEC00224561-AEC00224564] See AECOM Letter to PG&E dated 13-Jun-18

| Phase 3 Window | Delay Description                | PG&E      | JHK      | AECOM    | AECOM Vendors | Exc. Non-Comp | Cumulative Delay |
|----------------|----------------------------------|-----------|----------|----------|---------------|---------------|------------------|
| I              | PG&E tie-ins                     | 10        | 0        | 0        | 0             | 0             | 10               |
| II             | Leaks at Valves V-163 and V-167  | 0         | 0        | 0        | 1             | 0             | 11               |
| II             | Weather                          | 0         | 0        | 0        | 0             | 3             | 14               |
| III            | Weather                          | 0         | 0        | 0        | 0             | 1             | 15               |
| IV             | Updated Fire Suppression Program | 0         | 0        | 0        | 5             | 0             | 20               |
| V              | ESD Hardware System Issue        | 0         | 0        | 0        | 5             | 0             | 25               |
| VI             | CAT Stand-By Generator           | 0         | 0        | 0        | 9             | 0             | 34               |
| VI             | Strainer Installation Issue      | 0         | 9        | 0        | 0             | 0             | 43               |
| VII            | CAT Stand-By Generator Regulator | 0         | 0        | 9        | 0             | 0             | 52               |
| VIII           | Substantial Completion           | 0         | 0        | -1       | 0             | 0             | 51               |
| <b>Total</b>   |                                  | <b>10</b> | <b>9</b> | <b>8</b> | <b>20</b>     | <b>4</b>      | <b>51</b>        |

1.49 The performance during this time period is also illustrated in Figure 1-3 on the following page.

### Overall Conclusion

1.50 I have summarized the responsibility for all three phases below.

| Phase        | PG&E       | JHK        | AECOM    | AECOM Vendors | Exc. Non-Comp | Cumulative Delay |
|--------------|------------|------------|----------|---------------|---------------|------------------|
| Phase 1      | 338        | 35         | 0        | 0             | 0             | <b>373</b>       |
| Phase 2      | 77         | 61         | 0        | 0             | 12            | <b>150</b>       |
| Phase 3      | 10         | 9          | 8        | 20            | 4             | <b>51</b>        |
| <b>Total</b> | <b>425</b> | <b>105</b> | <b>8</b> | <b>32</b>     | <b>4</b>      | <b>574</b>       |

Case 4:50-cv-02387-H2C Document 550-3 Filed 04/15/21 Page 12 of 145

Case 4:20-cv-05381-HSG Document 220-3 Filed 04/21/22 Page 16 of 142

## Phase 3 Summary



## 2 Introduction

### Author of this report

- 2.1 I, Ted Scott, am a Managing Director with Secretariat International. I have a Bachelor of Science degree in civil engineering and an M.B.A. from Virginia Tech. I have more than 25 years of experience in the engineering and construction industry and specialize in providing scheduling and project controls services as well as delay analyses, damage assessments, productivity studies, and cost estimates for clients. I have been appointed as an independent expert on numerous disputes and have considerable experience working on projects in the UK, the Middle East, the Far East, and the United States of America.
- 2.2 Full details of my qualifications and experience are included at Appendix A of this report.

### Instructions

- 2.3 Secretariat International has been retained by counsel for AECOM, to independently analyze the delays that were incurred during Phase 1 and 2 of the K2 Replacement at the Burney Compressor Station.
- 2.4 This report presents the results of my analysis to date and sets forth my findings, conclusions, and opinions with respect to delay.

### Documents Reviewed

- 2.5 Among the documents relied upon to form an opinion on the delay are:
- a) The Contract between PG&E and AECOM;
  - b) The Subcontract between AECOM and JH Kelly;
  - c) The Baseline Schedule dated 19 October 2016;<sup>34</sup>
  - d) Various progress updates of the Baseline Schedule;<sup>35</sup>
  - e) Commissioning Schedule submitted to PG&E on 2 February 2018;<sup>36</sup>
  - f) AECOM Monthly Reports;

---

<sup>34</sup> [JHK\_BURNEY\_00373392-JHK\_BURNEY\_00373402] AECOM Baseline Schedule

<sup>35</sup> I understand that the as-built schedule "2018-06-03 - Burney Project Schedule" has not been produced but is not in dispute. I also note that previous as-built schedules and schedule updates are included in AECOM's monthly reports through April 2018 and have been produced

<sup>36</sup> [BURNEY000298833-BURNEY000298983] AECOM Commissioning Schedule

- g) Meeting Minutes;
- h) AECOM and JH Kelly Daily Reports;
- i) Drawing Submittal Logs;
- j) Procurement Logs;
- k) RFI and Change Order Logs;
- l) Delay Notices;
- m) JH Kelly's Time Impact Analysis;
- n) C2G International's Schedule and Cost Analysis; and
- o) Deposition Transcripts for:
  - Dean Goward (AECOM Electrical Lead)
  - Khalid Maslen (PG&E Electrical designer)
  - Tom Lee (JH Kelly Scheduler / PM) DRAFT; and
  - Steve Lennon (JH Kelly Project Executive) DRAFT.

#### **Key Project Personnel**

2.6 As part of this analysis, I interviewed AECOM's key project personnel including:

- a) Don Divers (Senior Vice President);
- b) Steve Petto (Project Manager / Director);
- c) Dean Goward (Electrical Lead); and
- d) Mike Belanger (Vice President).

2.7 In addition to the above, I also had discussions with the following:

- a) Mr. Steve Lewis at HKA (Technical Expert).

#### **Structure of the Report**

2.8 The remaining sections of this report are as follows:

C926 4:50-CA-02387-H2C DOCUMENT 550-3 E1169 04\15\SS 6906 J8 01 J45

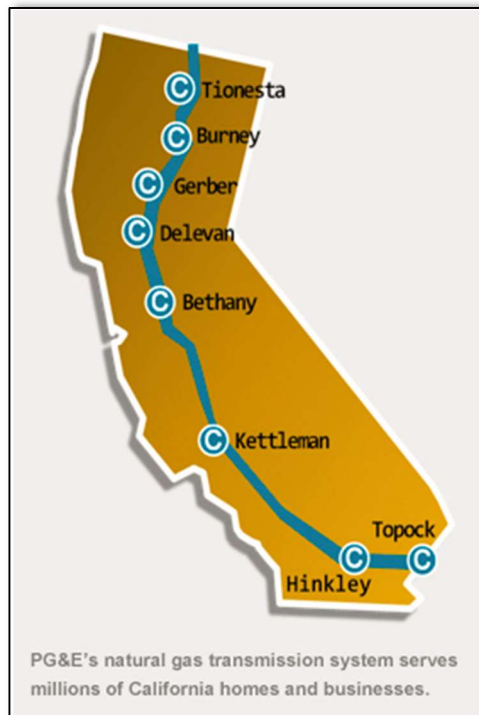
- a) Section 3 – Project Background;
- b) Section 4 – Methodology;
- c) Section 5 – Analysis of Delay to Engineering (Phase 1);
- d) Section 6 – Analysis of Delay to Construction (Phase 2);
- e) Section 7 – Analysis of Delay to Commissioning (Phase 3); and
- f) Section 8 – Conclusions on Delay.

2.9 I have included my full curriculum vitae in Appendix A

Case 4:50-cv-02387-H2C Document 550-3 Filed 04/15/25 Page 18 of 145

### 3 Project Background

- 3.1 The Burney Compressor station is one of many in Pacific Gas and Electric Company's ("PG&E") natural gas transmission system and ensures proper gas pressurization in two of their main transmission pipelines that run from Oregon to the Bay Area along the main transmission pipeline as shown in the Figure 3-1 below.



**Figure 3-1: PG&E Transmission Pipeline and Compressor Stations<sup>37</sup>**

- 3.2 In an effort to improving the safety and reliability of their natural gas system, PG&E decided to replace the existing natural gas compressor unit at the Burney Compressor station with a new unit capable of flowing 2.2 billion cubic feet per day of natural gas.<sup>38</sup>
- 3.3 On August 15, 2015, PG&E issued a Request for Proposal ("RFP") for the Burney K2 Replacement Project ("the Project").<sup>39</sup> The RFP included a 30% design set of drawings, provided by Gulf Interstates Engineering ("GIE"), and an additional RFP package which contained: a scope of work and general

<sup>37</sup> [https://www.pge.com/en\\_US/about-pge/environment/taking-responsibility/compressor-stations/compressor-stations.page](https://www.pge.com/en_US/about-pge/environment/taking-responsibility/compressor-stations/compressor-stations.page)

<sup>38</sup> [BURNEY000077086-BURNEY000079027] Contract between AECOM and PG&E

<sup>39</sup> [GIEC\_000000110-148 D01696450] PG&E issued a Request for Proposal August 15, 2015

conditions. These documents defined the project to be bid under an EPC (Engineer, Procure, Construct) contract delivery method.

- 3.4 In addition to the replacement of the compressor unit, the scope of work included the demolition of existing equipment and facilities as well as the installation of:

***“station and unit recycle valves, station controls, unit controls, upgrades to the station electrical systems, associated switchgear, MCC, UPS, Station Battery, Automatic Transfer System, station compressed air system, new auxiliary building, air compressor replacement, standby generator replacement, and a new compressor building.”<sup>40</sup>***

- 3.5 It is worth noting that the scope of work expressly stated in at least three locations that the intent of the project was to have minimal changes to the project defined by the bid package.<sup>41 42</sup>

| # | Risk Category | Assumptions  | Recommended Mitigation   |
|---|---------------|--|--|
| 1 | Engineering   | <p>AECOM acknowledges it would be our responsibility to download all required existing drawings, specifications, and other documents from PG&amp;E's online system. Our assumption is AECOM would have unrestrained access to all such needed documents and they would be immediately available from this system.</p> <p>AECOM assumes all submittals requiring PG&amp;E review/approval will be returned to AECOM within 10 business days or be deemed acceptable as is. We also assume a single review/approval cycle for all submittals, that is, all PG&amp;E comments will be consolidated into a single review set and once these comments are incorporated AECOM will issue the final documents for that cycle.</p> | <p>Any PG&amp;E-caused work delay affecting the project schedule that occurs as a result of vital existing drawings not being readily available could be justification for AECOM to seek schedule relief with respect to triggering Liquidated Damages and for extended overhead costs.</p> <p>The proposed Terms &amp; Conditions in the RFP included no discreet time period for PG&amp;E's review of documents. AECOM would request this condition during negotiations.</p> <p>AECOM intends to implement a collaborative work process with PG&amp;E staff such that changes to issued documents should be minimal. However, PG&amp;E-caused project delays could be justification for AECOM to seek schedule relief with respect to triggering Liquidated Damages and for extended overhead costs.</p> |

**Figure 3-2: PG&E's Bid Package<sup>43</sup>**

- 3.6 However, even though the above statements were made, and as will be discussed later in this report, it seems from the deposition of Dean Goward, that from the outset of the Project, PG&E knew that there were already problems with the 30% drawings.<sup>44</sup> Despite this knowledge, PG&E issued the RFP anyway.

- 3.7 Following several RFP clarifications in August and September 2015, AECOM submitted a bid to perform the work.<sup>45</sup>

C926 4:50-CA-02387-H2C DOCUMENT 550-3 E1169 0415T155 6986 ST 01 T45

<sup>40</sup> [BURNEY000075209] Contract between AECOM and PG&E para 4.4

<sup>41</sup> [GIEC\_000000110-148 D01696450] PG&E issued a Request for Proposal August 15, 2015

<sup>42</sup> Also see Dean Goward deposition page 64

<sup>43</sup> [BURNEY000295124]

<sup>44</sup> Dean Goward deposition page 42 - 43

<sup>45</sup> [BURNEY000295124] and [BURNEY000009503] AECOM's Bid submission and [GIEC\_00000099] RFP Clarifications

- 3.8 As was also discussed by Mr. Goward in his deposition, AECOM based its bid on the same 30% design drawings (developed by GIE) which was included in the RFP package.<sup>46</sup>
- 3.9 While AECOM based its bid on the above drawings, it is my understanding that they did so without knowing that the drawings were flawed.
- 3.10 In the kick-off meeting for the Project, held on 19 January 2016, AECOM was informed that PG&E would be providing them with design changes to the 30% design that was included with the RFP.<sup>47</sup> As discussed by Mr. Goward:

***One of the most significant changes was an inadequate 30 percent bid drawings that were produced by Gulf Interstate -- when I say "inadequate," inadequate for PG&E's review -- that essentially 30 percent package which we based our bid on and all our quantities and everything else, we were informed at the kickoff meeting with PG&E that that package is invalid..<sup>48</sup>***

- 3.11 On 11 February 2016, AECOM received PG&E's mark-ups from the RFP Electrical design package.<sup>49</sup>
- 3.12 That same day, on 11 February 2016, AECOM Technical Services ("AECOM") entered into an agreement with PG&E for the amount of \$40,510,262 to perform all engineering, procurement and construction services required to complete the Burney K2 Replacement Project ("the Project") at the Burney Compressor Station.<sup>50</sup>
- 3.13 A layout of the existing Burney Compressor station overlaid with the new scope of work can be seen in Figure 3-3 below. The blue represents new work while the green represents existing buildings.

Case 4:20-cv-02387-HCE Document 550-3 Filed 04/15/21 Page 55 of 145

<sup>46</sup> Dean Goward deposition page 43

<sup>47</sup> [BURNEY000069212] BURNEY K2-KOM Minutes\_2016-01-19 item 25

<sup>48</sup> Dean Goward deposition page 43

<sup>49</sup> [BURNEY000081945-BURNEY000081955 (report), BURNEY000081953 (pg. w/change items)] AECOM March 2016 Monthly Report, Change Management Items under Consideration item 11

<sup>50</sup> [BURNEY000075174-BURNEY000075179] FE CCP AECOM 2501335149 02112016 Final fpd3.pdf



Figure 3-3: Layout of Plant (as Bid)<sup>51</sup>

- 3.14 As will be discussed herein, PG&E requested several changes over the course of the Project such that what was actually built was very different than what was bid. It is my understanding that many of these changes stemmed from the initial problems that PG&E knew it had with the 30% drawings.
- 3.15 The Figure 3-4 below represents the layout of the plant as-built (also where blue represents new work while the green represents existing buildings).

CASE 4:50-CV-02387-H2C DOCUMENT 550-3 FILED OCT 15 2021

<sup>51</sup> [GIEC\_000001840-1853 D01696439] Attachment 3\_GIEC\_000000110-148 D01696450 Page 37/39

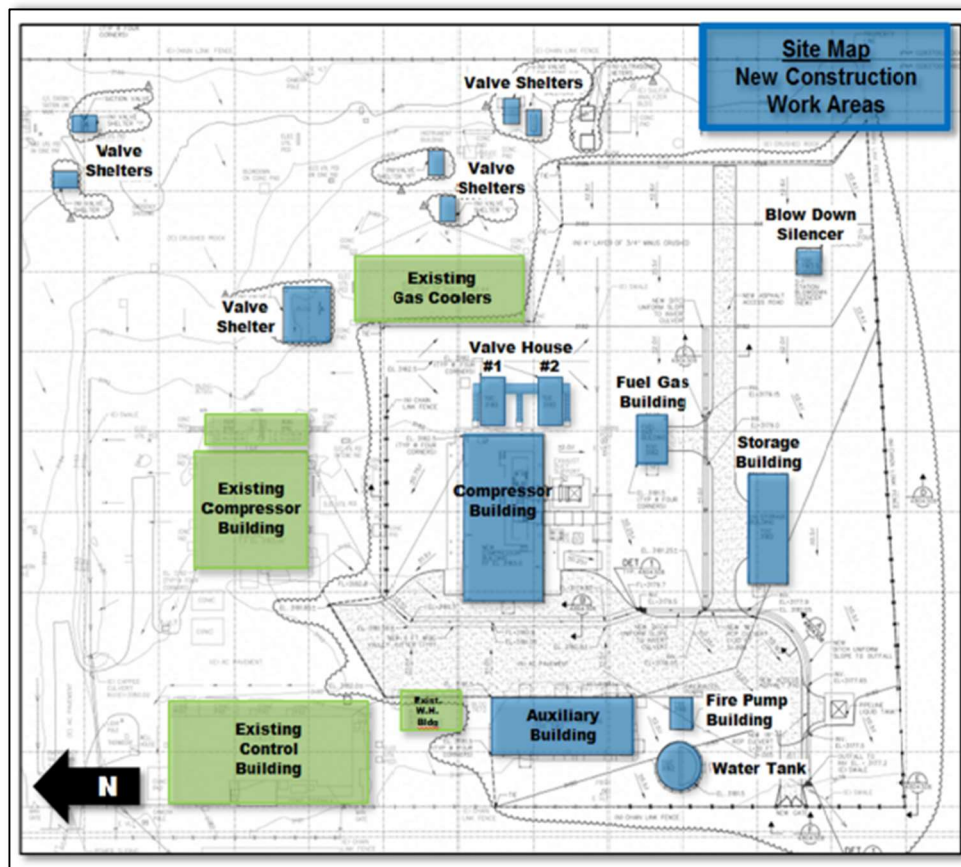


Figure 3-4: Final IFC Layout<sup>52</sup>

3.16 According to the Contract, the Project was divided into 2 Phases of work as follows:

- a) Phase 1 work was to be completed by November 2016 and included the procurement of long lead items and the development of engineering and construction documents (subject to review at the 30%, 60%, 90% and Issued for Construction ("IFC") design completion); and
- b) Phase 2 work was to be completed by 1 December 2017, including all field construction, on-site construction management, training, and supervision of commissioning required to turn over the Project to PG&E.<sup>53</sup> It should be noted that both the procurement and the design (from Phase 1) were needed to support the construction schedule set out in Phase

C926 4:50-CA-02382:H2C DOCUMENT 550-3 E1169 04/15/15 6906 54 01 J45

3.17 Further milestones were detailed in Section 4.1 of the Special Conditions of the Contract as follows:

<sup>52</sup> [JHK\_BURNEY\_00373208-JHK\_BURNEY\_00373266] JH Kelly February 2018 Delay claim figure at Page 9/59

<sup>53</sup> [BURNEY000075212] Contract between AECOM and PG&E para 5.4

| Major Milestone                    | Phase 1           | Phase 2                 | Notes                                   |
|------------------------------------|-------------------|-------------------------|---|
| Select Compressor Supplier         | July 30, 2015     |                         | PG&E Action                             |
| Award EPC Contract                 | December 1, 2015  |                         | PG&E Action                             |
| NTP                                | February 5, 2016  |                         |   |
| Begin Phase I                      | February 8, 2016  |                         |   |
| Procure Compressor Package         | March 25, 2016    |                         | EPC Contractor perform for PG&E         |
| 30% Design Review                  | May 5, 2016       |                         |   |
| 60% Design Review                  | June 23, 2016     |                         |   |
| 90% Design review                  | August 25, 2016   |                         |   |
| IFC drawings Complete              | October 20, 2016  |                         |   |
| Engineering Completion             | November 7, 2016  |                         | IFCs and Specifications Approved        |
| Long Lead Material Purchase        | Feb thru Nov 2016 |                         |   |
| Begin Phase II                     |                   | October 24, 2016        |   |
| Construction Mobilization          |                   | October 24, 2016        | Mobilization at Burney Site             |
| Long Lead Materials at Site        |                   | TBD                     | Compressor Package Delivery             |
| Preliminary Construction           |                   | October - November 2016 | Site investigation and site preparation |
| Project Construction at Site       |                   | March – November 2017   |   |
| Station outage for Tie-in and Test |                   | August to Nov 17,       | PG&E Station Clearance                  |
| Tie-In L-400 and L-401             |                   | August 1, 2017          | End PG&E Clearance                      |
| Commissioning and Testing          |                   | November 1, 2017        |   |
| Substantial Completion             |                   | November 17, 2017       | Final Turnover to PG&E                  |
| Project Complete and Demob         |                   | December 1, 2017        |   |

Figure 3-5: Contract Milestone Schedule<sup>54</sup>

- 3.18 In the event that the above milestones were not met, Contract section 5.7.1 specified that liquidated damages applied to the Phase 1 and 2 completion milestones as follows:

***“5.7.1 Late Completion Liquidated Damages***

***5.7.1.1 PG&E's construction and commercial operation schedule is based upon the required Phase One and Phase Two completion dates provided in 4.1 above. Contractor's failure to meet either of these dates will result in added project costs and other damages to PG&E. It will be extremely difficult for Contractor and PG&E to identify the amounts of increased or additional costs attributable to Contractor's failure to meet the required completion dates. Therefore, should Contractor fail to meet one or all of the specified completion dates,***

<sup>54</sup> [BURNEY000075208-BURNEY000075209] Contract between AECOM and PG&E para 4.1

***Contractor and PG&E agree that Contractor or shall pay PG&E liquidated damages per day of delay, provided the total amount of late completion payments for liquidated damages shall not exceed \$1,500,000.00, as follows:***

***5.7.1.2 Phase One: Contractor shall achieve Completion of Phase One Work by the Engineering Completion Date set forth in Section 4.1. If Phase One completion is not achieved by the Engineering Completion Date, Contractor shall pay to PG&E as liquidated damages and not as a penalty an amount equal to \$10,000 per day for each day by which Engineering Completion is not achieved.***

***5.7.1.3 Phase Two: Contractor shall achieve Substantial Completion for Phase Two Work by the Date set forth in Section 4.1. If Phase Two completion is not achieved by the Phase Two Substantial Completion Date, Contractor shall pay to PG&E as liquidated damages and not as a penalty an amount equal to \$20,000 per day for each day by which Phase Two Commissioning Completion not achieved.***<sup>55</sup>

- 3.19 As will be discussed in detail herein, due to the problems with the 30% drawings as well as preferential changes made by PG&E, AECOM did not achieve partial Substantial Completion of Phase 1 until 16 January 2017 and full completion until 15 November 2017 – **373 calendar days later than planned.**
- 3.20 It is my understanding that PG&E granted a time extension for Phase 1 until 16 January 2017 (when partial Substantial Completion was achieved) and is not seeking Liquidated Damages for any delays to Phase 1 thereafter.
- 3.21 On or around 21 October 2016, as AECOM was at the 90% design submittal of Phase 1 Engineering of the Project, AECOM entered into a subcontract with JH Kelly for the Phase 2 Construction of the Project at a lump sum price of \$14,341,281.00.<sup>56</sup>
- 3.22 JH Kelly mobilized to the site on or around 1 March 2017 and began to commence work.<sup>57</sup> Due to a number of issues that will be discussed herein, Substantial Completion for the Project was not achieved until 6 June 2018 – **201 calendar days later than contractually required.**

<sup>55</sup> [BURNEY000075208-BURNEY000075209] AECOM Contract with PG&E, Attachment 3, Specific Conditions section 5.7

<sup>56</sup> [AEC01036572 (this doc was produced natively due to size, so it only has 1 bates number)] JH Kelly CONTRACT 60482831-SC-001\_2016-10-21\_Fully Executed.pdf

<sup>57</sup> See As-Built Schedule Activity ID: BCS.220 "Remobilize - Phase II"

- 3.23 Due to the delays to Phase 1 and Phase 2 noted above, I have been retained to independently identify and quantify the cause(s) of delay each phase. While the assessment of responsibility for the delay is ultimately for the Trier of Fact to decide, I have attempted to assist based on my understanding of the various issues. The following sections of this report sets out my analysis in this regard.

## 4 Methodology

4.1 As there are a number of recognized methodologies for analysing delay, I reviewed the Construction Contract as a first step in determining which one to use on this Project. In this regard, the most relevant clauses seem to be Sub-Clauses 6.9, 6.10 and 7.1 of Attachment 1 to the Contract and Sub-Clause 4.8 of Attachment 2 to the Contract.

4.2 Based on my review of these Sub-Clauses, none of them specify a methodology to be used in analysing delay stating only that the:

***“Contractor shall submit to PG&E a written statement supporting the claim as soon as practicable but not more than 30 days after the action or decision giving rise to the claim.”<sup>58</sup>***

4.3 Given that the Contract is silent in this regard, the methodology adopted, in my opinion, should be based on industry standards and best practice. To that end, there are generally three favoured methodologies in the Industry for performing delay analyses including:

- a) Time Impact Analysis (“TIA”);
- b) Time Slice Windows Analysis; and
- c) As-Planned vs. As-Built Analysis.

4.4 The TIA approach is a prospective analysis which attempts to estimate the projected delay by modelling individual delay events into the schedule that was in place at the time the event occurred. In my view, this approach is useful when the project is on-going and the full matrix of facts relevant to delay and progress are not available until after the event. That being said, because the TIA is a modelled approach and at best can only approximate reality, its results are hypothetical. TIA’s also require fully robust and regularly updated schedules which were not developed on this Project. As an example, the Project schedules were not updated to include the new design criteria (i.e., added underground Duct Banks) until late July 2017 and additionally there were no updates for the key time period between September and November 2017. It is therefore my opinion that this method is not recommended on this Project.

4.5 The Time Slice Windows Analysis is a retrospective analysis and, in my view, would normally be a suitable approach for analyzing delay on a project such as this one. However, like the TIA, this

---

<sup>58</sup> [BURNEY000075133] General Conditions of the Contract (Attachment 2) Section 4.8

approach also requires fully robust and regularly updated schedules. As mentioned previously, the schedules submitted on this project do not meet these criteria. It is therefore my opinion that this method is also not recommended on this Project.

- 4.6 The As-Planned vs. As-Built Analysis is too a retrospective analysis. However, unlike the other two approaches, this methodology can be performed with less-than-ideal schedule data (i.e., a fully functional baseline is not necessary). The analyst can simply use the baseline schedule as it is found, and subjective modifications are not required. As a result, the methodology focuses more directly on the as-built critical path, so the trier of fact can evaluate all the facts and opinions that lead to that path. The focus can remain on what actually happened, as opposed to modelled events predicting what might have happened (i.e., like a theoretical or prospective analysis). Due to these factors, the As-Planned vs. As-Built Analysis is my recommended approach.

- 4.7 In describing the “As-Planned versus As-Built Windows” methodology, an industry leading publication in the field of construction law, Keating on Construction Contracts, states:

***“In this method the contemporaneous or actual critical path is established not by a dynamic analysis using programming software but rather by common-sense and practical analysis of the available facts. The windows tend to be defined by significant milestones or events that occurred within the project.***

***A major advantage of the windows analysis methods is that they attempt to analyse the causes of delay contemporaneously and with a firm base in the as-built record of what actually happened on site within a particular window.”<sup>59</sup>***

- 4.8 Furthermore, the widely referenced Society of Construction Law (or “SCL”) Delay and Disruption Protocol (2nd Edition) defines the “As-Planned versus As-Built Windows” methodology as follows:<sup>60</sup>

***“The as-planned versus as-built windows analysis method is the second of the ‘windows’ analysis methods. As distinct from a time slice analysis, it is less reliant on programming software and usually applied when there is concern over the validity or reasonableness of the baseline programme and/or contemporaneously updated programmes and/or where there are too few contemporaneously updated programme. In this method, the duration of the works is broken down into windows. Those windows are framed by revised contemporaneous programmes, contemporaneously updated***

<sup>59</sup> Keating on Construction Contracts 10th Edition

<sup>60</sup> SCL Delay Protocol 2<sup>nd</sup> Edition Paragraph 11.6

***programmes, milestones or significant events. The analyst determines the contemporaneous or actual critical path in each window by a common-sense and practical analysis of the available facts. As this task does not substantially rely on programming software, it is important that the analyst sets out the rationale and reasoning by which criticality has been determined. The incidence and extent of critical delay in each window is then determined by comparing key dates along the contemporaneous or actual critical path against corresponding planned dates in the baseline programme. Thereafter, the analyst investigates the project records to determine what delay events might have caused the identified critical delay. The critical delay incurred and the mitigation or acceleration achieved in each window is accumulated to identify critical delay over the duration of the works.”***

- 4.9 For background, the ‘critical path’, the central aspect of any delay analysis methodology, is defined by the SCL as follows:<sup>61</sup>

***“Critical Path: The sequence of activities through a project network from start to finish, the sum of whose durations determines the overall project duration. There may be more than one critical path depending on workflow logic. A delay to the progress of an activity on the critical path will, without acceleration or re-sequencing, cause the overall project duration to be extended, and is therefore referred to as a ‘critical delay’.”***

- 4.10 As noted above, the “As-Planned versus As-Built Windows” methodology is less reliant on programming (scheduling) software than the “Time Impact Analysis” methodology, and more grounded in the facts as established by the Project record. Typically, analyses that rely heavily on specialist scheduling software (such as Primavera) and periodic schedule updates take a more prospective or forward-looking view, many times ignoring what, as a matter of fact, impacted project completion. Prospective-type analyses primarily use theoretical inputs that cannot deliver results which reliably reflect the as-built sequence and are subject to manipulation by the user. At best, these types of analyses can only predict the potential impact that a delay event may have on the critical path, as opposed to whether the Project was delayed as a result of a claimed event.

- 4.11 In my view, the “As-Planned versus As-Built Windows” methodology tied to the Project record is the best option for analyzing the critical delays to the Project. My analysis starts with the actual effect

<sup>61</sup> SCL Delay Protocol 2<sup>nd</sup> Edition Appendix A Definitions and glossary

(i.e., the amount of delay incurred) and then seeks to determine the cause(s) of that delay. Furthermore, my approach and overall analysis:

- a) allows for a conclusion on the actual cause(s) of delay,
- b) is not overly complex or unwieldy,
- c) takes into account shifts in the critical path and is capable of addressing concurrent delay, mitigation and/or acceleration.

4.12 In the sections that follow, I've identified the most appropriate baseline schedule and as-built contemporaneous information to use as the basis for the "As-Planned versus As-Built Windows" methodology approach.

#### **The As-Planned vs. As-Built Analysis**

4.13 This method compares the baseline schedule (the "as-planned") with the work as it was actually completed (the "as-built"). The as-built can be compiled using contemporaneous records, actual dates recorded in the schedules, or a combination of these and other similar sources. By comparing the baseline with the as-built, the variances (i.e., delays) from the planned performance can be readily identified.

4.14 This method makes it possible to perform a like-for-like comparison to assess either the differences between individual activities (or groups of activities) or the differences between the project completion dates. Once the delays are identified, the causes of each delay can also be determined through a review of the contemporaneous records. The resultant delays can then be utilized to facilitate the quantification of time-related damages.

4.15 The As-Planned vs. As-Built Analysis requires a stepped approach, as follows:

- a) First, gain an understanding of the Contractor's planned sequence of the construction.
- b) Second, the actual critical path is identified by an application of common sense and a practical analysis of the available facts. The critical path is identified by stepping through the project chronologically and applying the facts and the events (including management's contemporaneous decision making) as they occur rather than looking at the project from a purely retrospective basis.
- c) Third, establish the incidence and extent of delay by comparing the actual critical path against the corresponding activities and milestones in the Baseline Schedule. The delay analysis should be broken down into manageable and meaningful periods or 'windows' of time (based on significant milestones or project events) in which to consider the critical path and the effects of delay events.

- 4.16 By way of helpful guidance, the following is an excerpt related to the As-Planned versus As-Built methodology contained in Keating on Construction Contracts:

***“In this method the contemporaneous or actual critical path is established not by a dynamic analysis using programming software but rather by common-sense and practical analysis of the available facts. The Windows tend to be defined by significant milestones or events that occurred within the project.***

***A major advantage of the windows analysis methods is that they attempt to analyse the causes of delay contemporaneously and with a firm base in the as-built record of what actually happened on site within a particular window.”<sup>62</sup>***

- 4.17 Despite the advantages of using the “As-Planned vs. As-Built” method, there are several points to contemplate prior to selecting this approach for analyzing delay including that this method:
- a) Obligates the analyst to deduce the as-built critical path, which could be perceived as subjective;
  - b) Requires the as-built schedule to be created, which is a labor-intensive endeavor; and
  - c) Is sometimes considered to be a “global” approach.
  - d) In consideration of the above, it is my position that the As-Planned vs. As-Built methodology is still the best tool to quantify delay on this Project because:
  - e) The As-Planned vs. As-Built methodology is transparent (i.e., underlying decisions cannot be obscured or hidden). Therefore, any subjectivity can easily be evaluated by the Tribunal; and
  - f) The ‘global’ approach is minimized by the selection of windows which help to discreetly identify delay events and their impacts.

- 4.18 For ease of discussion, I have broken my analysis into three distinct phases as follows:

- a) Analysis of Delay to Design (Phase 1);
- b) Analysis of Delay to Construction (Phase 2); and
- c) Analysis of Delay to Commissioning (Phase 3).

### **The Baseline Schedules**

- 4.19 For each of the above phases, I use a different baseline schedule to measure delay as set out below.

---

<sup>62</sup> Keating on Construction Contract, Stephen Furst QC BA and Honorable Sir Vivian Ramsey MA, 9th Edition p 296

- 4.20 For my analysis of Phase 1 (Engineering), I have used the milestones set out in the Contract (as shown previously in Figure 3-5 and herein referred to as the Contract Milestone Schedule). As can be seen from Figure 3-5, design of the Project was divided into interim submittals for the 30%, 60%, 90% and 100% IFC design reviews. My analysis of Phase 1 is detailed in Section 5 of this report.
- 4.21 As will be discussed in my analysis of Phase 2, the initial benchmark from which I measure delay is the 19 October 2016 Project schedule. This schedule was submitted to PG&E along with the 90% design on 19 October 2016 and appears to be the first schedule that included detailed JH Kelly's construction activities. This schedule also met the Phase 2 Construction milestones outlined in Section 4.1 of the Special Conditions of the Contract. I have therefore used this schedule as the Baseline Schedule for the construction portion of the work (as detailed in Section 6 of this report).
- 4.22 As is typical with projects of this type, as the Project was nearing Mechanical Completion in late 2017, a "Commissioning Schedule" was developed. This schedule was submitted to PG&E on 2 February 2018. I have therefore used this schedule as the Baseline Schedule for the commissioning portion of the work. (i.e., the period after 2 February 2018 as detailed in Section 7 of this report).

#### **The Actual Critical Path**

- 4.23 In my opinion, the key element in the "As-Planned vs. As-Built" Analysis is determining the actual critical path. This is typically done by:
- a) From the fully populated as-built schedule, identifying the critical path by applying common sense and construction management and planning experience in an objective and practical manner, supported where necessary by discrete and careful calculation using scheduling analysis.
  - b) Confirming and cross checking these results by reviewing the planned logic and evaluating any likely changes based on contemporaneous evidence.
- 4.24 The as-built data that I have relied on has primarily come from the AECOM's schedule updates, Case 4:19-cv-01001-JCL Document 1-1 Filed 10/18/21 Page 32 of 32 Project monthly, weekly and daily reports (for both JH Kelly and AECOM).

## 5 Analysis of Delay to Design (Phase 1)

5.1 As mentioned previously, Phase 1 included the Engineering design of the Project. According to the Contract, the Engineering design was subject to interim review periods 30%, 60%, 90% and Issued for Construction (“IFC”) design completion.

5.2 To assist in the discussion and analysis of delays, I have broken the total period of performance into 2-time windows as can be seen in the table below. These time windows were established based on revisions to the planned sequence of Phase 1 engineering, key events and shifts in the critical path.

| Window | Description                   | Time Frame                 |
|--------|-------------------------------|----------------------------|
| I      | Partial Completion of Phase 1 | 11 Feb 2016 to 16 Jan 2017 |
| II     | Full Completion of Phase 1    | 16 Jan 2017 to 15 Nov 2017 |

5.3 I discuss the above Windows in detail below and for each one I consider:

- The start and finish date of that window and the critical delay at the start and finish date of each window;
- The critical path during each window;
- The performance of the works during each period; and
- The primary cause(s) of delay during each window.

**Phase 1 Window I – Partial Completion of Phase 1 (11 Feb 2016 to 15 Jan 2017)*****Introduction***

- 5.4 From the outset of the Project and even during the Project Kick-off meeting, PG&E knew that the initial 30% design included within the RFP for the Project would need to be revised. As will be discussed below, these known changes to the design (the majority of which were related to the electrical work) ultimately delayed the completion of the Phase 1 design such that partial Completion of Phase 1 was not granted until 15 January 2017.<sup>63</sup>
- 5.5 In terms of critical delay in this time window:
- a) The beginning of this time window, 11 February 2016, is the date of the Contract;
  - b) According to the Contract Milestone schedule, Phase 1 (i.e., Engineering Completion) was to be achieved by 7 November 2016;<sup>64</sup>
  - c) Due to PGE's design changes, AECOM did not achieve the partial Substantial Completion (or all scopes of work except for Electrical) until 15 January 2017 – **69 calendar days later than planned** (15 January 2017 – 7 November 2016 = 69 days); and
  - d) The Project therefore was delayed **69 calendar days in this time period**.
- 5.6 From my review of the contemporaneous documents and the progress achieved during this time, the principal cause of critical delay in this window appears to have been PG&E's change in design and decision to revise the existing 30% design included in the RFP.

***Changes to PG&E's Bid Design***

- 5.7 In the kick-off meeting for the Project, held on 19 January 2016, AECOM was informed that PG&E would be providing them with comments on the 30% design that was included with the RFP (as can be seen in the excerpt of the meeting minutes below).<sup>65</sup>

CASE 4:20-cv-02387-H2C Document 550-3 Filed 04/15/25 Page 32 of 145

---

<sup>63</sup> [AEC00058072-AEC00058100] See AECOM Change Order 4

<sup>64</sup> [BURNEY000075208-BURNEY000075209] Contract Milestone Schedule

<sup>65</sup> [BURNEY000069212] BURNEY K2-KOM Minutes\_2016-01-19 item 25



|  <br>GT Project Delivery System |  |           |           |   |
|---|--|-----------|-----------|---|
| MEETING MINUTES   |  |           |           |   |
| 22  | AECOM to arrange conference call with JH Kelly to discuss plans for PG&E's shop inspection, NDE, welder qualifications, etc. | Steve     | TBD       | After contract formation between AECOM and JHK                        |
| 23  | PG&E will clear trees in the area south of the existing yard for the new facilities.   | Bill      | June 2016 | AECOM will advise AECOM noise study staff that trees will be removed. |
| 24  | AECOM to search for Gulf Interstate Eng'g DGN files in PG&E Records.   | Brad Wolf | TBD       |   |
| 25  | PG&E Electrical to provide AECOM with their comments on the GIE 30% package.   | Khaled    | TBD       | TBD = When SharePoint is up and running.                              |

Figure 5-1: Item 25 of Kick-Off Meeting Minutes<sup>66</sup>

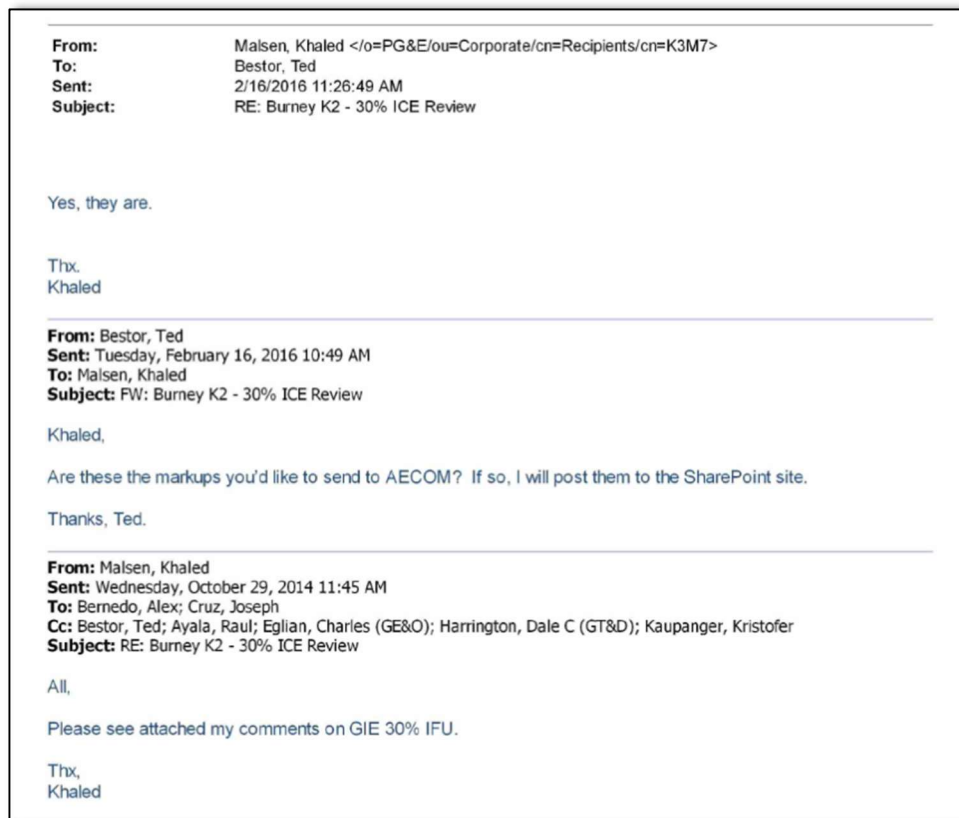
- 5.8 On 11 February 2016, and as can be seen below, AECOM received PG&E's mark-ups from the RFP Electrical design package.<sup>67</sup> I understand from Mr. Lewis, that these comments included (among other things) major changes to the Single Line Diagram (SLD) and questions regarding the Electrical Load Study.<sup>68</sup>

CASE 4:50-cv-02387-H2C Document 550-3 Filed 04/15/22 Page 30 of 145

<sup>66</sup> [BURNEY000069212] BURNEY K2-KOM Minutes\_2016-01-19 item 25

<sup>67</sup> [BURNEY000081945-BURNEY000081955 (report), BURNEY000081953 (pg. w/change items)] AECOM March 2016 Monthly Report, Change Management Items under Consideration item 11

<sup>68</sup> [BURNEY00308248-9 and BURNEY000313242-54]



**Figure 5-2: Markups to 30% GIE Design<sup>69</sup>**

- 5.9 After receiving the comments, and a week later than planned, PG&E issued the Notice to Proceed (“NTP”) to AECOM on 12 February 2016 thereby commencing Phase 1 of the Project. Note that this was 7 days later than contemplated by the Contract (12 February 2016 – 5 February 2016 = 7 days).
- 5.10 As noted previously, the design of the Project was divided into interim submittals for the 30%, 60%, 90% and 100% IFC design reviews. AECOM’s progress in completing these design submittals is set out below.

### **30% Design**

- 5.11 After the kick-off meeting, and as discussed by Mr. Goward, it became clear that the project had not been scoped properly in the RFP and that the design relied upon in the Bid was going to be changed as set out below.<sup>70</sup>

***“The kickoff meeting was in the morning and we received the Gulf Interstate drawing package with the red cross that went through the***

<sup>69</sup> [BURNEY000308248\_PGEProductionVOL003] E-mail from Mr Malsen dated 16 February 2016

<sup>70</sup> Dean Goward deposition page 57

***single line diagram that day. It was at that point that we knew that this project was not scoped properly.”<sup>71</sup>***

- 5.12 On 21 March 2016, during an electrical scoping meeting, PG&E acknowledged that there were errors in the GIE Electrical Load Study and that AECOM was to review the equipment list and perform a new Electrical Load Study.<sup>72</sup> On that same day, Khaled Maslen of PG&E, sent additional GIE drawing mark-ups as well as additional GIE load study mark-ups.<sup>73</sup> As discussed by Mr. Goward:

***“There was an electrical load calculation that GIE had prepared and there was a number of comments on the load calculation which also meant that the loading calculations had to be completely redone as well. Not only that, there was actually missing information on Gulf Interstate's drawings. It did not represent the full extent of the scope at all. For example, there is -- there's an existing building at Burney that remains and still there today. The Gulf Interstate drawings only showed one panel being required inside that building and one feeder going to that building, but in reality we had to do a lot of rewiring and repowering existing loads in the existing administration building. I think it was the control building is the right term, existing control building, that was just not shown on Gulf's drawings.”<sup>74</sup>***

- 5.13 In accordance with the Contract Milestone Schedule, AECOM and PG&E conducted the 30% design review on 5 May 2016. However, as evidenced in the meeting minutes for the 30% design review, several additional design changes were discussed in the meeting as detailed below:

- a) Expanding the size of the Auxiliary Building by 15 feet;<sup>75</sup>
- b) Arc resistant design was added to the MCCs and switchgear.<sup>76</sup>
- c) A New Fire Suppression System by COSCO;<sup>77</sup> and
- d) New wiring for the new MCC.<sup>78</sup>

- 5.14 As discussed by Mr. Goward in his deposition (excerpted below), even though AECOM submitted what it thought were the 30% design drawings on 5 May 2016, they essentially had to start again:

[Case 4:20-cv-02387-H2C Document 550-3 Filed 04/15/21 Page 38 of 145](#)

<sup>71</sup> Dean Goward deposition page 57 -58

<sup>72</sup> [AEC00784773] BURNEY K2 REPLACEMENT MEETING MINUTES 03-21\_DRAFT Issue Item 1

<sup>73</sup> [AEC00137509-22]

<sup>74</sup> Dean Goward deposition page 57

<sup>75</sup> [AEC00998802 and AEC00998804] BURNEY K2 Replacement Design Review Meeting Minutes\_2016-05-05 item 9, 17 and 42

<sup>76</sup> [AEC00998802] BURNEY K2 Replacement Design Review Meeting Minutes\_2016-05-05 item 9

<sup>77</sup> [AEC00998801 and AEC00998802] BURNEY K2 Replacement Design Review Meeting Minutes\_2016-05-05 item 7 and 10

<sup>78</sup> [AEC00998803] BURNEY K2 Replacement Design Review Meeting Minutes\_2016-05-05 item 31

*"So we went to the 30 percent -- we submitted the 30 percent design, had the meeting with PG&E on the 5th of May, 2016, and we found out during that meeting that Khaled no longer wanted the single bus arrangement, so he went back to a main-tie-main. Okay, let's start again. So I thought we had a 30 percent design, but it turned out we didn't because Khaled didn't want the single bus anymore, he changed his mind."*<sup>79</sup>

- 5.15 In its May 2016 monthly report, AECOM recorded that several other changes were under consideration by PG&E. As a result, the 60% design review would need to be rescheduled from 23 June 2016 (as shown below).<sup>80</sup>

| MONTHLY REPORT - May 2016  |   |
|--|---|
| Work Accomplished This Month / Planned for Next Month  |   |
| Work Accomplished This Month   | Work Planned for Next Month   |
| <b>This Month's Meetings Held</b><br>Bi-Weekly Status Meetings <ul style="list-style-type: none"> <li>5/10 (WebEx only)</li> <li>5/24 (San Ramon)</li> </ul> Other Meetings <ul style="list-style-type: none"> <li>5/05 30% Design Review (San Ramon)</li> <li>5/09 Quarterly Meeting with PG&amp;E Management - Meeting with project stakeholders from PG&amp;E and AECOM (San Ramon); covered Solar issue and PG&amp;E 2016 funding challenge</li> <li>5/10 Meeting with Design Drafting to discuss 30% Design Review comments (San Ramon)</li> <li>5/16 Follow up meeting with Design Drafting to discuss conflicting drafting requirements (San Ramon)</li> <li>5/25-26 Geotechnical field work at the Burney site was completed.</li> </ul> | <b>Next Month's Meetings Planned</b><br>Bi-Weekly Status Meetings <ul style="list-style-type: none"> <li>6/07 (WebEx only)</li> <li>6/21 (San Ramon)</li> </ul> Other Meetings <ul style="list-style-type: none"> <li>6/01 and 6/02 PHA San Ramon</li> <li>6/01 Meeting with PG&amp;E Contracts management to discuss use of Unifier</li> <li>6/03 Site Visits to Gerber and Delevan</li> <li>6/23 60% Design Review Meeting <b>POSTPONED; to be rescheduled</b></li> </ul> |

**Figure 5-3: AECOM May 2016 Monthly Report showing 60% design review rescheduled<sup>81</sup>**

### **60% Design**

- 5.16 In the months following the 30% design review meeting, I understand that PG&E (via its Engineer Mr. Malsen) requested several more changes which triggered a significant redesign effort by AECOM.<sup>82</sup> These changes are outlined below:

- On 21 July 2016 AECOM and PG&E held a meeting to finalize the Electrical design concept in which it was decided by PG&E that "Smart MCC's," added SEL relays to equipment, and an "Off-Skid Generator Control Panel" were to be used on the Project;<sup>83</sup> and
- On 5 August 2016, AECOM received a revised equipment list from PG&E (which I understand from Mr. Lewis is a part of conceptual design and should have been finalized prior to PG&E issuing the RFP).<sup>84</sup>

<sup>79</sup> Dean Goward deposition page 66

<sup>80</sup> [BURNEY000081921-BURNEY000081934] AECOM May 2016 Monthly Report

<sup>81</sup> [BURNEY000081921-BURNEY000081934] AECOM May 2016 Monthly Report

<sup>82</sup> Dean Goward deposition page 43

<sup>83</sup> [BURNEY000127757 and BURNEY000127759] BURNEY K2\_Electrical\_Minutes\_2016-07-21item 5 and 22

<sup>84</sup> [BURNEY000104047-BURNEY000104071] AECOM August 2016 Monthly Report

- 5.17 As discussed by Mr. Goward, even during the 60% design period, PG&E had not finalized its electrical requirements which should have been included in the RFP:

***"So that period between May and August was a lot of confusion and not very clear direction from PG&E at all. And ultimately, it boiled down to us making a request of PG&E at one of those meetings to please, please send us a drawing as to what you need, the same drawing that should have been in the RFP."*<sup>85</sup>**

- 5.18 In a quarterly meeting with PG&E management on 10 August 2016, it was acknowledged that the design was approximately 2 months delayed and the principal challenges were:

- a) the late contract for the Solar Turbine / Compressor;
- b) the Electrical design still being in conceptual phase; and
- c) the PG&E delays in generating change orders.<sup>86</sup>

- 5.19 As discussed by Mr. Goward, by August 2016, AECOM began preparing change orders to submit to PG&E:

***"Because once we got that one-line diagram in August, we realized there was a lot of change on this project and put together a series of change orders. I don't know exactly what their numbers were, but -- when I say "numbers," the submittal number.***

***And PG&E had a lot of trouble, a lot of trouble approving those change orders, despite the fact that in the RFP, they said Hey, look, minimal changes to the GIE drawings and we'll be on board with any changes that occur to this package as a result. That was the RFP. But then in reality, we had a lot of trouble. We didn't get a change order approval, I believe, until maybe December of that year."*<sup>87</sup>**

- 5.20 On 5 August 2016, AECOM notified PG&E that the design would be delayed due to equipment ordering issues which were caused by PG&E's failure to issue change orders to cover the costs of the revised MCC and switchgear equipment as well as other Electrical design changes enacted by Khaled

Case 4:17-cv-01381-T-HC Document 550-3 Filed 04/11/21 Page 40 of 145

- 5.21 As discussed by Mr. Goward:

<sup>85</sup> Dean Goward deposition page 68

<sup>86</sup> [AEC00805482-AEC00805490] 8-10-16 Burney Quarterly Update draft

<sup>87</sup> Dean Goward deposition page 77

<sup>88</sup> [AEC00955948-56] 8-5-16 email with attached RFI0025 (AEC00955948-56.)

*"What was also very frustrating about that period was that Khaled was bypassing us and talking directly to our suppliers. So I was getting phone calls from SEL and Eaton saying what is going on and what is the scope on this project. And I didn't even know those communications were happening. I found out through our supplier that Khaled was talking to SEL and trying to -- I don't know, I guess he was trying to reduce the overall cost."*<sup>89</sup>

- 5.22 On 31 August 2016, due to the above changes, AECOM finally submitted the 60% design review - **69 days later than planned** (31 August 2016 - 23 June 2016 = 69 days).<sup>90</sup>
- 5.23 As evidenced in the 60% design review meeting minutes, several additional design changes were discussed including:
- a) Enlarging the electrical and Control Room within the Auxiliary Building;<sup>91</sup>
  - b) Adding a Hazardous Material (Storage) Building;<sup>92</sup>
  - c) Performing a Fire Suppression Study for the Compressor and Auxiliary Building;
  - d) Changes to the UPS System (i.e., Redundant UPS);<sup>93</sup>
  - e) Minimize above ground conduit;<sup>94</sup>
  - f) Changing the wire tagging system on the drawings for the project;<sup>95</sup> and
  - g) Eliminating below ground access to wire pull boxes and replacing with above ground pull boxes.<sup>96</sup>
- 5.24 When the 60% design comments were received, it is my understanding from Mr. Goward that PG&E had made no further major changes to the electrical system via the 60% drawing review (and I understand from Mr. Lewis that the 60% design package is typically the last opportunity to make any major changes). However, as will be discussed below, PG&E subsequently continued to make major changes to AECOM's design.

CASE 4:20-cv-02387-HSC Document 550-3 Filed 04/11/21 Page 47 of 145

<sup>89</sup> Dean Goward deposition page 78

<sup>90</sup> [AEC00720828-AEC00720834] 8-31-16\_BURNEY\_K2\_MINUTES\_FINAL

<sup>91</sup> [AEC00720830] 8-31-16\_BURNEY\_K2\_MINUTES\_FINAL item 20

<sup>92</sup> [AEC00720830 and AEC00720832] 8-31-16\_BURNEY\_K2\_MINUTES\_FINAL item 26 and 45 (although it is noted in the Consolidated discipline chronology matrix that this was requested in June 2016)

<sup>93</sup> [AEC00720830] 8-31-16\_BURNEY\_K2\_MINUTES\_FINAL item 21

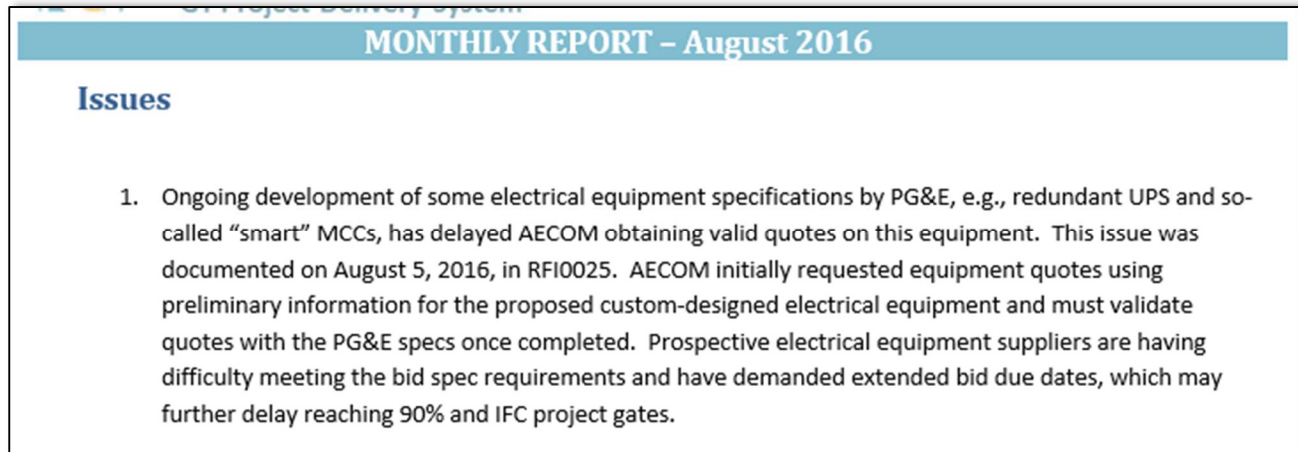
<sup>94</sup> [AEC00720833] 8-31-16\_BURNEY\_K2\_MINUTES\_FINAL item 49

<sup>95</sup> [AEC00720832] 8-31-16\_BURNEY\_K2\_MINUTES\_FINAL item 42

<sup>96</sup> [AEC00720831] 8-31-16\_BURNEY\_K2\_MINUTES\_FINAL item 34

### 90% Design

- 5.25 As summarized in the August 2016 Monthly report (excerpted below), AECOM reported that the ongoing electrical equipment changes were impacting AECOM's procurement and could delay the 90% and IFC design stages as excerpted below.<sup>97</sup>



**Figure 5-4: Excerpt of August 2016 Monthly Report<sup>98</sup>**

- 5.26 While AECOM continued to develop the 90% drawings, the first Contract Change Order was executed on 19 September 2016 which included \$1.3M of new work (including changes to fittings and valves, revisions to design drafting standards, and a redundant UPS) as well as \$2.4M in credits for the removal of the new gas cooler from the project scope.<sup>99</sup>
- 5.27 Despite these design changes, AECOM submitted the 90% design documents on 19 October 2016 and the 90% design review meeting was held on 2 November 2016 – **69 days later than contemplated in the Contract planned** (2 November 2016 – 25 August 2016 = 69 days).<sup>100</sup> In other words, again, AECOM did not lose any further time between the 60% and 90% drawing submissions
- 5.28 However, as can be seen in the excerpt below, although the 90% design package was submitted, it was issued with holds due to continued late vendor data.<sup>101</sup>

[Case 4:50-cv-02387-H2C Document 550-3 Filed 04/15/22 Page 45 of 145](#)

<sup>97</sup> [BURNEY000104020-BURNEY000104035] AECOM September 2016 Monthly Report

<sup>98</sup> [BURNEY000104047-BURNEY000104071] AECOM August 2016 Monthly Report

<sup>99</sup> [AEC00209455-AEC00209522] AECOM Contract Change Order 1

<sup>100</sup> See As-Built Schedule Activity ID: BCS.165 "90% Design Review"

<sup>101</sup> [BURNEY000120434-BURNEY000120455] AECOM October 2016 Monthly Report

| MONTHLY REPORT –October 2016   |  |
|--|--|
| <b>Issues</b>  |  |
| <p>1. Electrical equipment bids were received on September 20<sup>th</sup>. After multiple meetings with the prospective suppliers, PG&amp;E authorized AECOM to submit an RFI (and subsequent PCO) for smart MCCs in lieu of traditional MCCs, a PF correction capacitor, and high resistance grounds based on a tentative award to Eaton. The 90% package was issued with HOLDS placed where electrical equipment vendor prints are needed to complete. Upon PG&amp;E authorization AECOM will issue the purchase order.</p> |  |

Figure 5-5: Excerpt of October 2016 Monthly Report<sup>102</sup>

### 100% IFC Design

- 5.29 After the 90% design review meeting, AECOM was able to continue to progress the design of most of the various engineering disciplines (i.e., Civil, Structural, Mechanical) with the exception of the Electrical design. This package was noted as being dependent on PG&E decisions regarding major electrical equipment.<sup>103</sup> Once these decisions were made, AECOM stated that they would need 10 weeks to finalize the Electrical package as can be seen below.

| # | Decision  | Decision Date | Notes  |
|---|---|---------------|--|
| 1 | AECOM to submit "Unstamped IFC Drawings" to PG&E by Dec.15. Submittal will include all drawings except Electrical and Fire Protection Drawings. PG&E to return comments within a two week time frame. | 11/22/16      | Electrical package 10 weeks after PG&E decision is made allowing AECOM to purchase major electrical equipment. |

Figure 5-6: Excerpt from 22 November 2016 Bi-Weekly Meeting<sup>104</sup>

- 5.30 It is worth noting that, on 1 December 2016, during a pre-mobilization meeting between PG&E and AECOM, PG&E (i.e., Ron Whyte) expressed that Construction may not be ready to move forward into Phase 2 as seen in the excerpt of the meeting minutes below.<sup>105</sup>

C926 4:50-CA-0238T-H2C DOCUMENT 550-3 E1169 0415T155 6906 43 01 T45

<sup>102</sup> [BURNEY000120434-BURNEY000120455] AECOM October 2016 Monthly Report

<sup>103</sup> [BURNEY000121170] 2016-11-22\_BURNEY\_K2\_MEETING\_MINUTES

<sup>104</sup> [BURNEY000121170] 2016-11-22\_BURNEY\_K2\_MEETING\_MINUTES

<sup>105</sup> [BURNEY000121214-BURNEY000121216] 2016-12-01\_BURNEY\_pre-mob\_minutes

|   |   |          |
|---|---|----------|
| 2 | <p>Ron voiced his impression that he did not yet have a “warm and fuzzy feeling” regarding the project’s readiness to go forward with Construction in late Feb/early March. He related how some of the formal requirements were relaxed for the Phase 1 construction given the limited scope of work (grading, fencing, etc.), e.g., no project-specific QA/QC plan was provided, but PG&amp;E wouldn’t have that latitude for Phase 2.</p> | 12/01/16 |
|---|---|----------|

**Figure 5-7: Excerpt from 1 December 2016 Pre-Mobilization Meeting<sup>106</sup>**

- 5.31 On 14 December 2016, PG&E authorized AECOM to issue the purchase order for the major electrical equipment (i.e., Smart MCC’s, Switchgear etc.).<sup>107</sup> With the finalization of equipment selection, AECOM was finally able to get the necessary vendor information, details, and drawings required to progress the Electrical design and thus the 10-week timeframe discussed above started.<sup>108</sup>
- 5.32 As AECOM continued to work on the Electrical design, they submitted the 100% stamped IFC drawings for all other design packages (except for Electrical and Fire Suppression). These drawings were approved on 15 January 2017.<sup>109</sup>

Case 4:50-cv-02387-H2C Document 550-3 Filed 04/15/21 Page 44 of 145

<sup>106</sup> [BURNEY000121214-BURNEY000121216] 2016-12-01\_BURNEY\_pre-mob\_minutes

<sup>107</sup> [BURNEY000081794] PO for the MCCs, Switchgear, and Switchboards

<sup>108</sup> Dean Goward deposition page 50

<sup>109</sup> [BURNEY000081791-BURNEY000081810] AECOM January 2017 Monthly Report

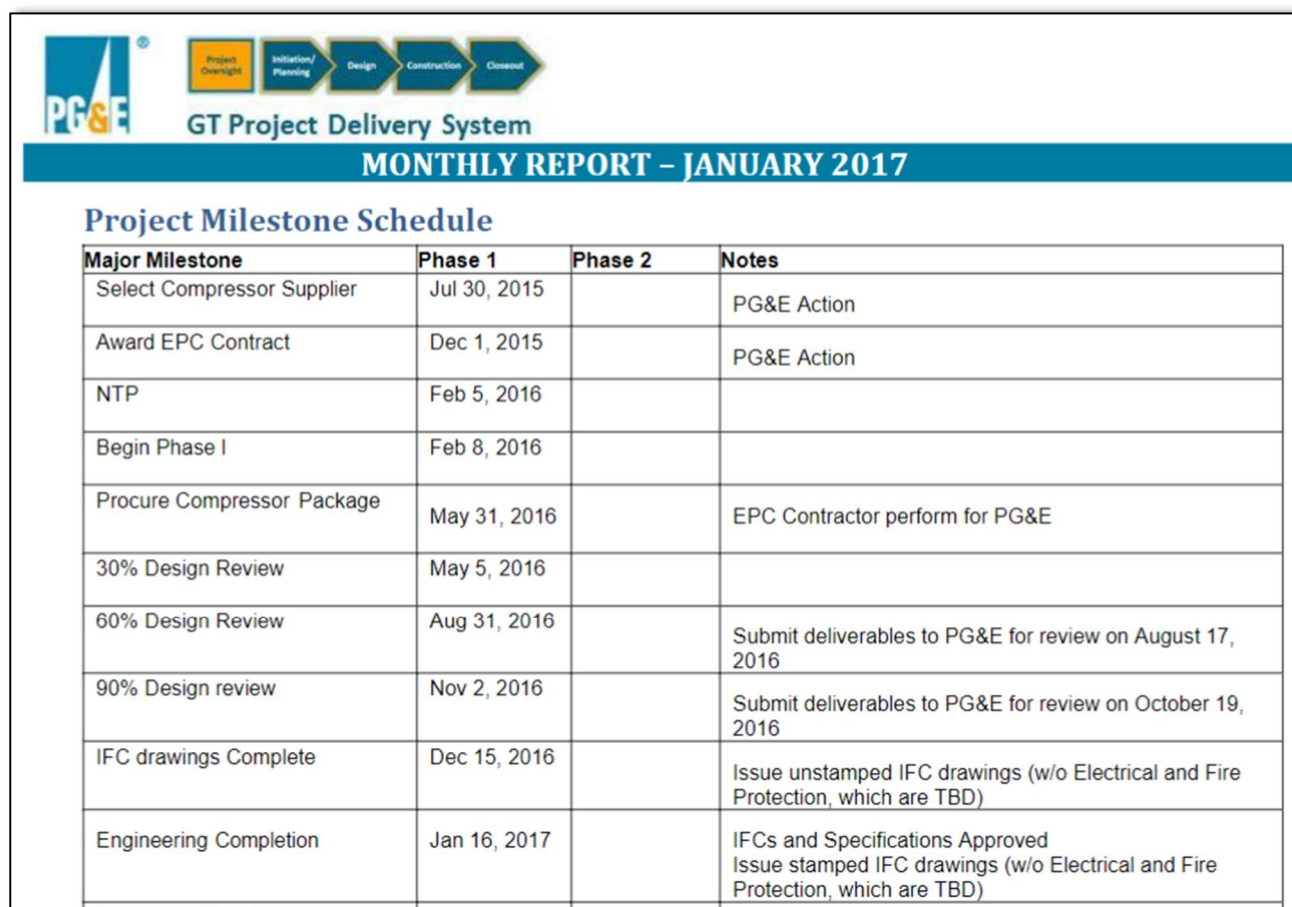


Figure 5-8: January 2017 Monthly Report for Approved IFC Design<sup>110</sup>

5.33 Due to the above submission, AECOM's Phase 1 (i.e., Engineering Completion Milestone) was apparently deemed by PG&E to be achieved on 15 January 2017 (albeit, without the electrical package).

5.34 Given the planned completion for Phase 1 in the Contract (i.e., 7 November 2017), partial Substantial Completion for Phase 1 was achieved **69 days later than planned** (15 January 2017 – 7 November 2016 = 69 days).<sup>111</sup>

C926 4:50-CA-02387-H2C DOCUMENT 550-3 FILED 04/15/15 6906 42 01 145

5.35 It is noted that on 17 January 2017, the day after the partial Substantial Completion for Phase 1 was deemed to have been achieved, Change Order 2 was executed between AECOM and PG&E which included:

- a) An increase to the Contract price by \$1.25M;

<sup>110</sup> [BURNEY000081791-BURNEY000081810] AECOM January 2017 Monthly Report

<sup>111</sup> See As-Built Schedule Activity ID: BCS.180 "Engineering Completion"

- b) Changes to the major Electrical Equipment (i.e., Smart MCC's and SEL Switchgear); and
- c) Increased size of the Auxiliary Building.<sup>112</sup>

### Conclusion

5.36 The table below summarizes the actual delay incurred in Window I. It is my opinion that this delay was caused by PG&E's change in design, many of which stemmed from the issues contained in the 30% Design Drawings.

5.37 The performance during this time period is also illustrated in Figure 5-9 on the following page.

| Phase 1<br>Window | Cause of Delay                      | Delay in<br>Window (Days) |
|-------------------|-------------------------------------|---------------------------|
| I                 | Changes to PG&E's Bid Design (PG&E) | 69                        |
| <b>Total</b>      |                                     | <b>69</b>                 |

Case 4:20-cv-02387-H2C Document 550-3 Filed 04/15/21 Page 46 of 145

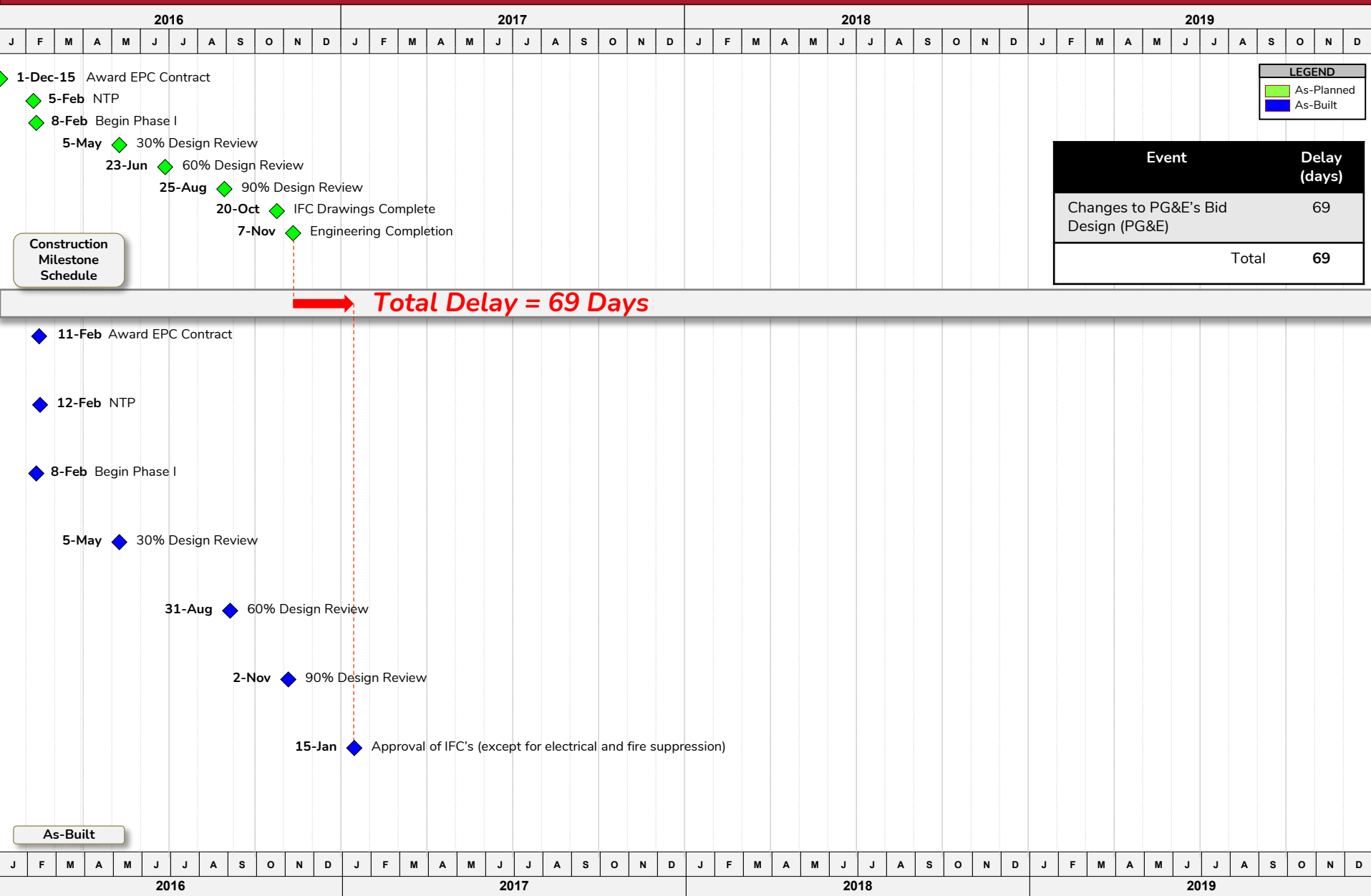
<sup>112</sup> [AEC00054296-AEC00054339] AECOM Change Order 2

# Burney Compressor Station K-2 Replacement Project

## Phase I Window I - Partial Completion of Phase I

Case 4:20-cv-05381-HSG Document 220-3 Filed 04/21/22 Page 47 of 142

Figure 5-9



### Phase 1 Window II – Full Completion of Phase 1 (16 Jan 2017 to 15 Nov 2017)

- 5.38 On 24 February 2017, a little over a month after receiving partial Substantial Completion for Phase 1, AECOM issued a draft IFC Electrical package for review. However, during the review of these drawings, PG&E decided it wanted to make further revisions to the design, including the addition of new design criteria.<sup>113</sup> It is my understanding that these changes caused AECOM to redesign, and redraw the Project.<sup>114</sup>
- 5.39 In an effort to mitigate the on-going delay to the Electrical design (and the knock-on impact it had to the construction work), AECOM issued the drawings in a piecemeal fashion such that the final IFC drawing was not issued until 15 November 2017.<sup>115 116</sup>
- 5.40 In my opinion, this decision by AECOM to issue the drawings in a piecemeal fashion ultimately helped the project, in that it allowed JH Kelly to continue its field operations and reduced what otherwise would have been far more significant delays to the Construction schedule had they waited for the full package to be received.

### **Introduction**

- 5.41 In terms of critical delay in this time window:
- a) At the beginning of this time window, Phase 1 was 69 days behind schedule;
  - b) According to the Contract Milestone Schedule, Phase 1 (i.e., Engineering Completion) was to be achieved by 7 November 2016;<sup>117</sup>
  - c) Due to preferential changes made by PG&E, AECOM did not achieve full Substantial Completion until 15 November 2017 – **373 calendar days later than planned** (15 November 2017 – 7 November 2016 = 373 days); and
  - d) The Project therefore was delayed 304 calendar days in this time period (373 days – 69 days = 304 days).
- 5.42 From my review of the contemporaneous documents and the progress achieved during this time, the principal cause of critical delay in this window appears to have been PG&E's preferential changes to

<sup>113</sup> It is noted that, this new design criteria has been discussed by Mr Goward as a "resiliency requirement". See also [AEC00571355-6]

<sup>114</sup> See Dean Goward Deposition page 82

<sup>115</sup> [JHK\_BURNEY\_00158253-JHK\_BURNEY\_00158254] See Summary Log of E&I IFC Drawings at exhibit 5 of JH Kelly electrical TIA

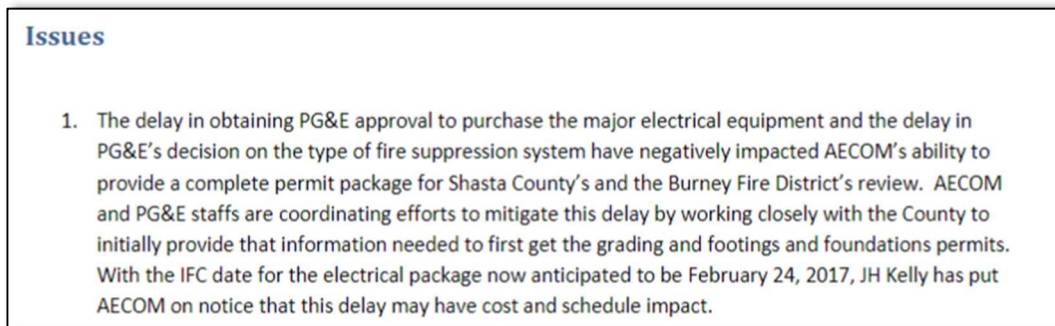
<sup>116</sup> [AEC00681353-AEC00681357] AECOM letter dated 15 November 2017

<sup>117</sup> [BURNEY000075208-BURNEY000075209] Contract Milestone Schedule

the Electrical design as well as the discovery of a conflict between the proposed duct bank and an existing utility line.

***PG&E's Preferential Changes to the Electrical Design***

- 5.43 As shown in AECOM's January 2017 monthly report, the IFC Electrical design was still incomplete at that time and was not anticipated to be submitted until 24 February 2017 (as shown in the excerpt below).<sup>118</sup>



**Figure 5-10: Excerpt from 1 December 2016 Pre-Mobilization Meeting<sup>119</sup>**

- 5.44 As it turns out, AECOM did issue an un-stamped electrical package on 24 February 2017. I note that this package included an IFC conduit plan for review as shown below.<sup>120</sup>

CASE 4:50-cv-02387-H2C Document 550-3 Filed 04/15/21 Page 48 of 145

<sup>118</sup> [BURNEY000081791-BURNEY000081810] AECOM January 2017 Monthly Report

<sup>119</sup> [BURNEY000081791-BURNEY000081810] AECOM January 2017 Monthly Report

<sup>120</sup> See Dean Goward deposition Exhibit 66

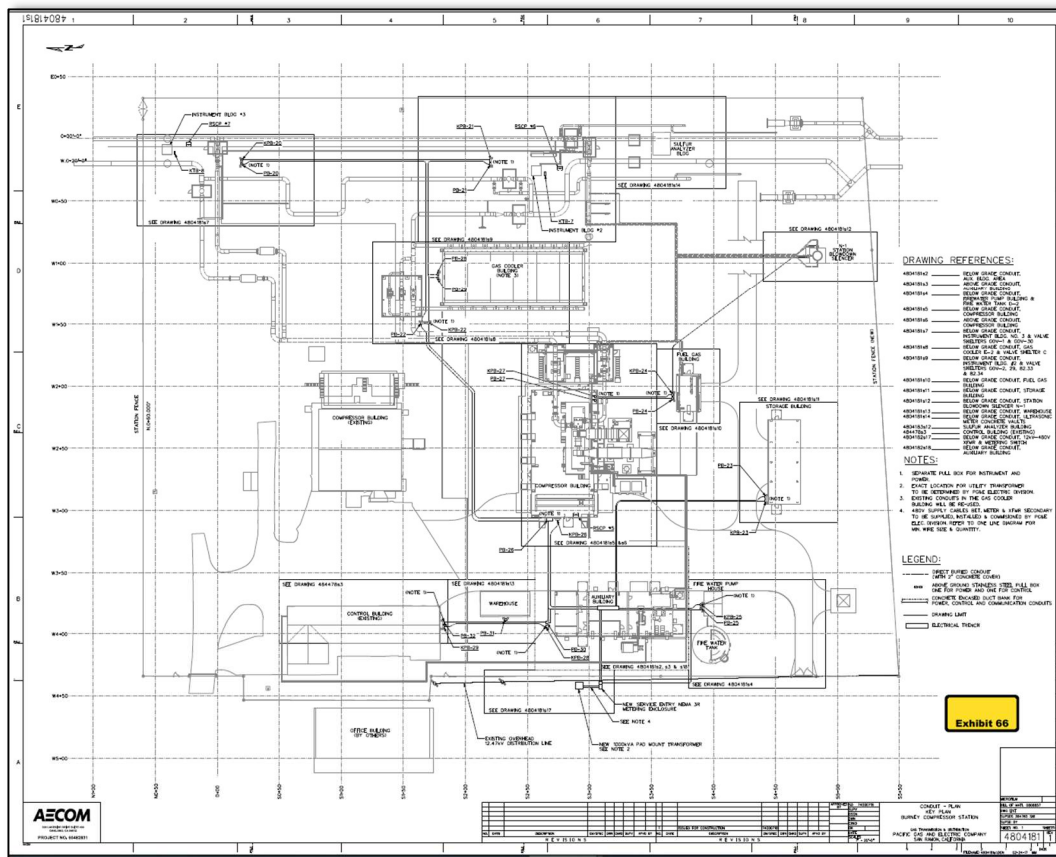


Figure 5-11: 24 February 2017 IFC Drawing<sup>121</sup>

5.45 As discussed by Mr. Goward, during the review of these IFC drawings, PG&E noted that they were still making changes to the design.<sup>122</sup>

***“...one of the major changes was, for some reason Khaled did not want to be able to see conduit inside the building on the walls.”***

***Khaled came in and said Hey, I want everything to come up through the slab. I don't want to see conduit on the walls unless there's a special exception. That's a big change. Putting everything underground and having to pinpoint exactly where those stub-ups need to go is absurd. Normally you would have the contractor, like JH Kelly, field route the conduit.”***<sup>123</sup>

5.46 It also my understanding that a conflict between a duct bank and an existing utility (a 34” gas line) was discovered at this time.

<sup>121</sup> See Dean Goward deposition Exhibit 66

<sup>122</sup> Dean Goward deposition page 83

<sup>123</sup> Dean Goward deposition page 83

- 5.47 To expedite the implementation of PG&E's changes, Mr. Maslen located himself in AECOM's Oakland offices between March 2017 and May 2017.<sup>124</sup> While he was there, he changed the basis of design for the wire and conduit which required a complete redesign and redrawing of the Project to an entirely new design criteria.<sup>125</sup>
- 5.48 I understand from discussions with Mr. Lewis, that this new design criteria is a fundamental change which should have been included in the RFP project requirements was not due to code requirements. In other words, it was a preferential change that PG&E wanted to make. I also understand it had the following implications:
- a) Shifting the majority of the above ground conduit into duct banks below ground;
  - b) Changing large conduit with multiple conductors to small conduit with single conductors;
  - c) Changing the ambient temperature at which the wire was to perform;
  - d) Changing conduit spacing requirements;
  - e) both changes "c" and "d" caused an increase in quantity for wire, conduit, and duct bank excavation;
  - f) Increasing the depth of conduit below the Auxiliary Building; and
  - g) Eliminating the below grade wire access points and replacing those with above ground stainless steel pull boxes for the underground duct bank.
- 5.49 With regard to re-routing the conduit to avoid the 34" gas line, once it was discovered, AECOM provided 3 options as follows:
- a) run duct bank trench deeper;
  - b) run duct bank above ground in a bridge structure to avoid gas line; and
  - c) re-route the duct bank to avoid that area completely.<sup>126</sup>
- 5.50 Mr. Lewis has noted that the conflict between the new duct bank location and the existing underground gas lines were shown on AECOM's 30%, 60% and 90% drawings. Despite this, and my understanding that JH Kelly was responsible for providing constructability reviews of AECOM's incremental design drawings, JH Kelly failed to notify AECOM of construction concerns with these

---

<sup>124</sup> See Goward Deposition page 85

<sup>125</sup> See Goward Deposition page 85

<sup>126</sup> See Goward Deposition page 98

conflicts until February 2017.<sup>127</sup> As a result, the redesign of the duct bank in the area of the cooler facility had a larger impact on the issuance of the IFC drawings than it otherwise should have.

5.51 As discussed by Mr. Goward, the third and least preferable option was chosen by PG&E which resulted in rerouting the duct to the eastern portion of the site, which significantly increased the length of duct bank.<sup>128</sup> I further understand from discussions with Mr. Lewis that he has analyzed the routing of the duct bank with respect to this existing utility and determined that the option selected was indeed a preferential change by PG&E, as either of the less impactful solutions would have been possible from an engineering standpoint.

5.52 In an effort to mitigate the on-going delay to the Electrical design (and the knock-on impact it had to the construction work), AECOM issued the IFC drawings for the Project in a piecemeal fashion.<sup>129</sup>

5.53 As discussed by Mr. Goward:

***“In a perfect world, you would have an IFC package ready for stamping and releasing to construction the way that other projects I've been a lead engineer on work. Not in this case. Because we're under such a schedule crunch because the construction schedule never moved out, we actually found ourselves in a situation where we're issuing engineering product to the field in a piecemeal fashion based on the schedule. So I believe the compressor building was maybe one of the first items that were to be built at Burney. So we focused our energy on that. Okay, Khaled, what do you want in the compressor building, work with him, and once we got it to a point where he was okay with it, the package was reviewed internally, ensured the calculations and the right level of quality was on the package, stamped it, issued it to JH Kelly for construction.”<sup>130</sup>***

5.54 Critically, on 5 May 2017, AECOM was able to issue the IFC Conduit layout as can be seen below which allowed the excavation work at the Auxiliary Building to commence on site.<sup>131</sup>

CASE 4:20-cv-02387-H2C Document 550-3 Filed 04/15/25 Page 25 of 145

---

<sup>127</sup> [BURNEY000075209] Contract between AECOM and PG&E Art. 1.4.1, 2.2.1, 2.17. See also JHK0050723-70 Pg 3, item 7 – lists and Pg 15.

<sup>128</sup> See Goward Deposition page 99-100

<sup>129</sup> See Dean Goward Deposition page 86-87

<sup>130</sup> Dean Goward Deposition page 86-87

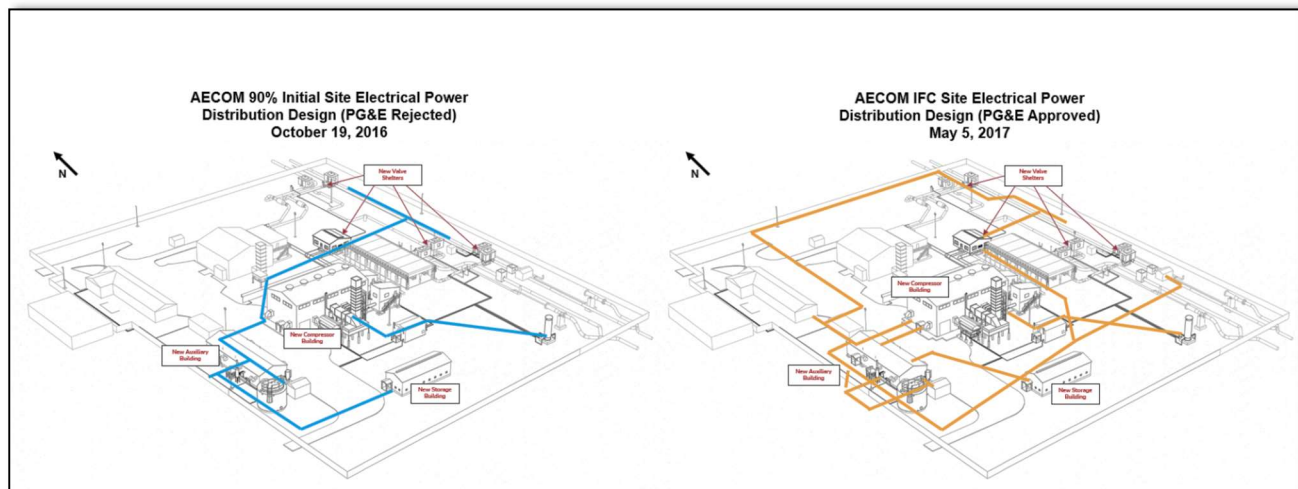
<sup>131</sup> See Goward Deposition Exhibit 67



5.55 As can be seen from Figure 5-13 below, the approved below grade Electrical design was fundamentally different from what AECOM has submitted at the 90% Design Stage (which were the drawings from which JH Kelly based its bid).<sup>133</sup>

<sup>132</sup> Dean Goward deposition Exhibit 67

ATTORNEY-CLIENT PRIVILEGED AND CONFIDENTIAL



**Figure 5-13: Pre IFC vs IFC routing for Duct Banks<sup>134</sup>**

- 5.56 I understand from discussions with Mr. Lewis, that these significant changes were attributable to PG&E's change in design criteria (i.e., preferential changes and nice to have additions).
- 5.57 I also understand from discussions with Mr. Lewis that the change in duct bank routing along the Northern portion of the site in the 5 May 2017 design (the left side of the drawing to the right) was due PG&E's refusal to allow the duct bank to be routed below or above the gas lines).
- 5.58 A list of the other piecemeal electrical IFC drawings after 5 May 2017 is outlined below:<sup>135</sup>
- a) 18 May 2017 – one lines, panel schedules, above grade conduit, lighting, site underground lighting conduit, lightning protection, grounding, installation details, wiring diagrams for lighting and outlets;
  - b) 26 May 2017 – lighting drawings, updated duct bank sections, site grounding;<sup>136</sup>
  - c) 12 June 2017 - BOM for conduit;<sup>137</sup>
  - d) 20 June 2017 – underground conduit;<sup>138</sup>
  - e) 30 July 2017 - underground conduit;<sup>139</sup>
  - f) 11 September 2017 – above ground conduit;<sup>140</sup>

C926 4:50-CA-00387-HEC Document 550-5 Filed 01/15/21 Page 24 of 145

<sup>134</sup> I note that this illustrative figure has been developed with annotations based on [JHK\_BURNEY\_00383758 (Graphic 2), JHK\_BURNEY\_00383791 (Ex. 6)]

<sup>135</sup> [JHK\_BURNEY\_00158253-JHK\_BURNEY\_00158254] See Summary Log of E&I IFC Drawings at exhibit 5 of JH Kelly electrical TIA

<sup>136</sup> [AEC00223541-4]

<sup>137</sup> [AEC00083204]

<sup>138</sup> [AEC00927875-81]

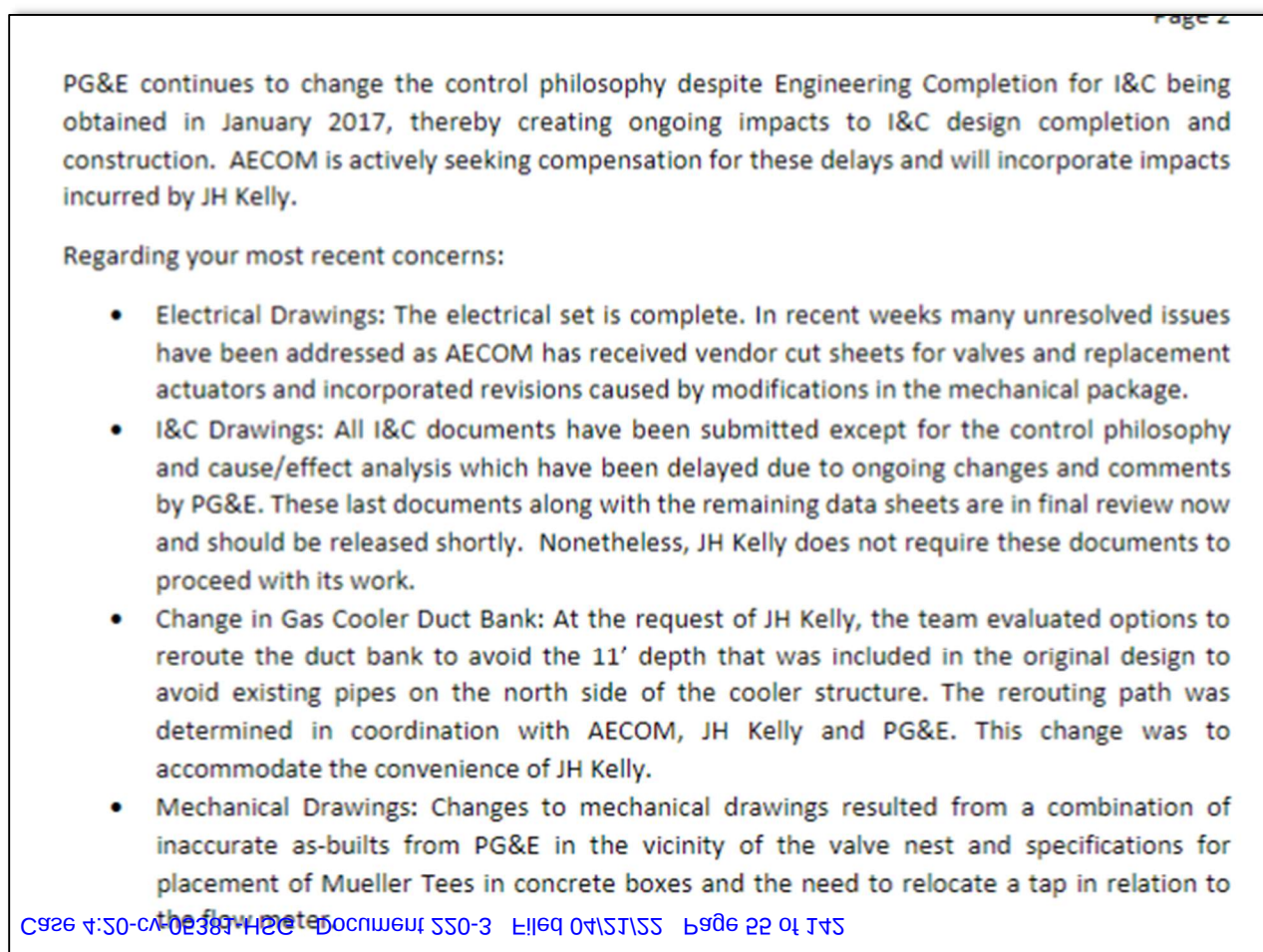
<sup>139</sup> [AEC674180559]

<sup>140</sup> [JHK\_Burner\_00057407-9]

- g) 22 September 2017 - above ground conduit;<sup>141</sup>
- h) 17 October 2017 - underground conduit;<sup>142</sup> and
- i) 15 November 2017 – grounding and lighting details.<sup>143</sup>

5.59 Based on the above, I have determined the end of Phase 1 to be 15 November 2017 coinciding with the issuance of the last IFC drawing.

5.60 As noted in AECOM's letter to JH Kelly (shown below), the Electrical design was also deemed contemporaneously to be complete on 15 November 2017.



**Figure 5-14: AECOM Letter regarding delays as of 15 November 2017<sup>144</sup>**

<sup>141</sup> [JHK\_BURNEY\_00158253-JHK\_BURNEY\_00158254] See Summary Log of E&I IFC Drawings at exhibit 5 of JH Kelly electrical TIA

<sup>142</sup> [JHK\_BURNEY\_00158253-JHK\_BURNEY\_00158254] See Summary Log of E&I IFC Drawings at exhibit 5 of JH Kelly electrical TIA

<sup>143</sup> [JHK\_BURNEY\_00158253-JHK\_BURNEY\_00158254] See Summary Log of E&I IFC Drawings at exhibit 5 of JH Kelly electrical TIA

<sup>144</sup> [AEC00681353-AEC00681357] AECOM letter dated 15 November 2017

5.61 It is worth noting that throughout 2017, PG&E continued to issue and approve change orders for the changes made during Phase 1 including:

- a) Change Order 3 on 21 February 2017 for \$814,150;
- b) Change Order 4 on 30 March 2017 for \$918,072;
- c) Change Order 5 on 8 June 2017 for \$627,790;
- d) Change Order 6 on 11 December 2017 for \$638,852 (which was disputed by AECOM); and
- e) Change Order 7 for \$4,142,761 (which is disputed).

5.62 I also note that Change Order 4, in addition to adding scope, granted an extension of time to the Phase 1 design to match the achievement of partial Substantial Completion (i.e., until 15 January 2017) as can be seen below.

Detailed Description: This is a no-cost contract change. Reference RFI00019. New contract dates for design deliverables due to delays with purchase order with Solar Turbines: 60% design review changed to August 31, 2016 90% design review changed to November 2, 2016 IFC changed to December 1, 2016 Engineering Complete changed to January 15, 2017 No change in construction completion date.

Figure 5-15: Excerpt of Change Order 4<sup>145</sup>

### Conclusion

5.63 The table below summarizes the actual delay incurred in Window II. While the majority of this delay was caused by PG&E's preferential changes to the Electrical design, it is my opinion that **70 days of this delay** (between 5 May 2017 - 24 February 2017 = 70 days) was also due to the need to reroute the duct bank around the existing utility conflict. Should it be found that JH Kelly was responsible for catching the conflict earlier than they did, then they would share accountability for the delay. For purposes of this report, I assumed this to be the case. However, based on the records that have been made available to me, I have not been able to determine exactly when the change to routing of the duct bank was made. I have therefore split the delay equally between PG&E and JH Kelly (i.e., 35 days to PG&E and 35 days to JH Kelly) as it seems that approximately half of the added duct bank is related to the rerouting around the existing conflict.

<sup>145</sup> [AEC00058072-AEC00058100] AECOM Contract Change Order 4

5.64 The Contractor's performance during this time period is also illustrated in Figure 5-16 on the following page.

| Phase 1 Window | Cause of Delay   | Delay in Window (Days) |
|----------------|--|------------------------|
|                | Delay from Previous Window   | 69                     |
| II             | PG&E's Preferential Changes to the Electrical Design (PG&E) and the conflict between the duct bank and the existing utility (JH Kelly) | 304                    |
|                | <b>Total</b>   | <b>379</b>             |

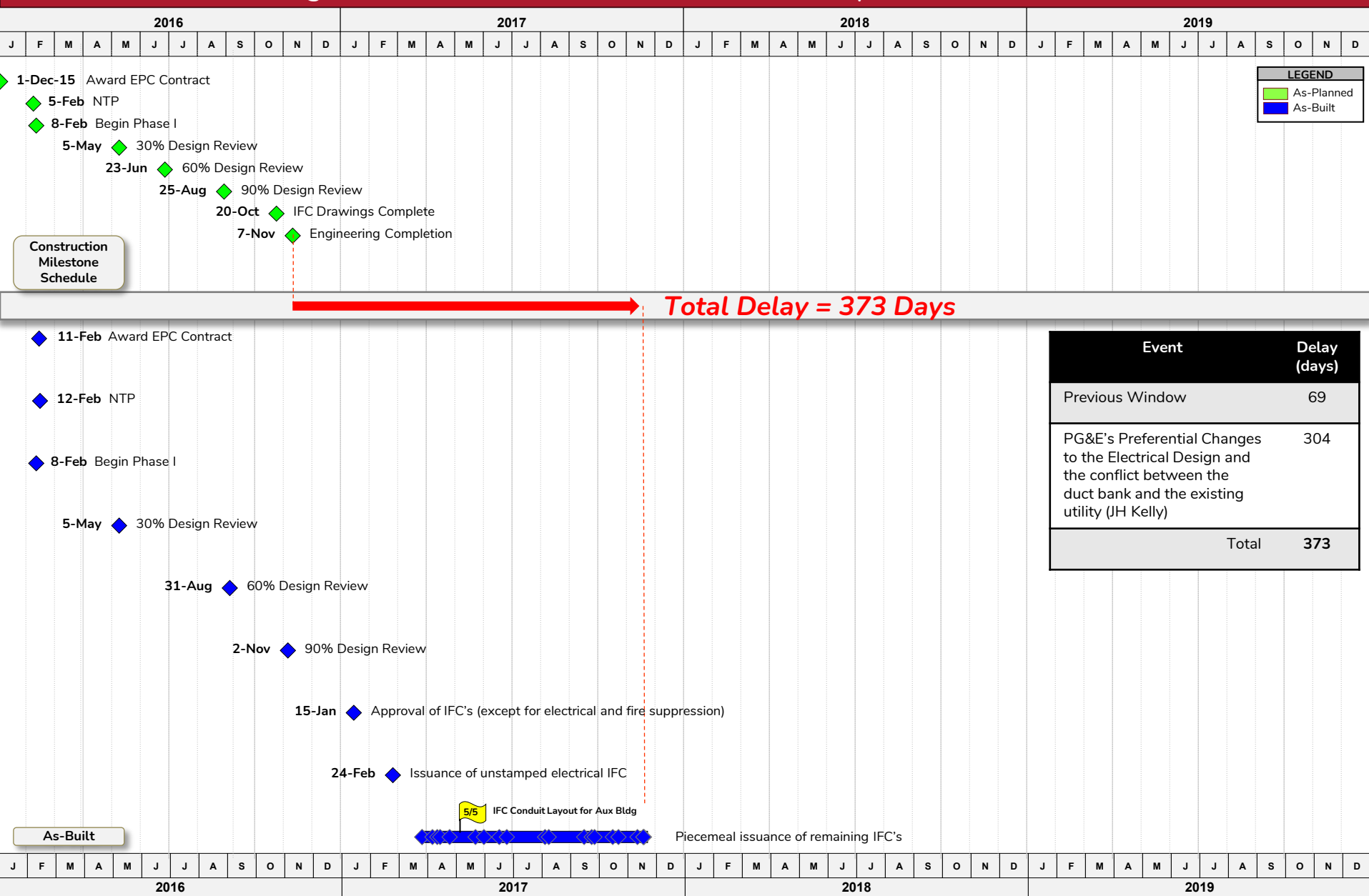
Case 4:50-cv-02387-H2C Document 550-3 Filed 04/15/22 Page 21 of 75

# Burney Compressor Station K-2 Replacement Project

Case 4:20-cv-05381-HSG Document 220-3 Filed 04/21/22 Page 58 of 142

## Figure 5-16 Phase I Window II - Full Completion of Phase I

Figure 5-16



### Conclusions of Analysis of Delay to Phase 1 Design

- 5.65 As discussed above, Phase 1 completion was not achieved until 15 November 2017 - **373 days later than planned**. In my opinion, the first 69 days of this delay (through the issuance of all IFC packages on 15 January 2017 except for Electrical and Fire Suppression) was due to PG&E's change in design, many of which stemmed from the issues contained in the 30% Design Drawings.
- 5.66 I have also determined that the 70-day delay between 24 February 2017 (the issuance of the unstamped Electrical design) and 5 May 2017 (the issuance of the IFC Conduit layout for the Auxiliary Building) was due to both PG&E's new design criteria as well as the need to reroute the duct bank around the existing utility conflict. Should it be found that JH Kelly was responsible for catching the conflict earlier than they did, then they would share accountability for the delay. For purposes of this report, I assumed this to be the case and have split the delay 35 days to PG&E and 35 days to JH Kelly in the table below.
- 5.67 The remaining delay, I attributed solely to PG&E's new design criteria.

| Phase 1 Window | Delay Description  | PG&E       | JHK | AECOM | Exc. Non-Comp | Cumulative Delay |
|----------------|--|------------|-----|-------|---------------|------------------|
| I              | Changes to PG&E's Bid Design   | 69         | 0   | 0     | 0             | 69               |
| II             | PG&E's Preferential Change and the conflict between the duct bank and the existing utility | 269        | 35  | 0     | 0             | 373              |
| <b>Total</b>   |  | <b>338</b> | 35  | 0     | 0             |                  |

## 6 Analysis of Delay to Construction (Phase 2)

- 6.1 This section of the report deals with the Construction phase of the Project and covers the period between 17 October 2016 and 2 February 2018.

### The Planned Sequence of Construction

- 6.2 In March 2016, AECOM issued (and included in its monthly progress reports) an initial schedule for completing the Project.<sup>146</sup> However, based on my review of this schedule, it does not contain enough detail, particularly for the construction of the Project, to be of any use in a delay analysis. As an example, this schedule does not contain construction activities for the entire scope of the buildings (e.g., the only buildings identified in this schedule are for the Auxiliary and Turbine/Compressor buildings).
- 6.3 In my opinion, it was not until October 2016 that AECOM developed a sufficiently detailed construction schedule. This schedule, which was dated 19 October 2016, was the first time that a work breakdown structure (“WBS”) was developed for the Phase 2 construction activities. Additionally, this was the first schedule which included the entire scope of buildings (including the Auxiliary, Compressor, Valve Houses, Fuel Gas and Storage Buildings).
- 6.4 The schedule was sent to PG&E in the October 2016 monthly progress report along with the 90% design drawings.<sup>147</sup>
- 6.5 It is my understanding that this schedule was also used as the basis for JH Kelly’s bid and was the most complete schedule at the time that JH Kelly executed its Contract with AECOM.<sup>148</sup> It was also the schedule that JH Kelly used in performing their own delay analysis.<sup>149</sup>
- 6.6 PG&E did not provide any comments to this schedule and thus, it is my understanding that the schedule was deemed to have been approved.

C926 4:50-CA-02387-H2C Document 550-3 Filed 04/15/15 Page 60 of 145

- 6.7 I do note that this Baseline Schedule included several instances of open-ended logic (i.e., missing logical links) and constraints, which results in this schedule not having a valid critical path.

---

<sup>146</sup> [BURNEY000081945-BURNEY000081955] See AECOM Monthly Reports from March 2016

<sup>147</sup> [BURNEY000120434-BURNEY000120455] See AECOM Monthly Report for October 2016

<sup>148</sup> See Tom Lee deposition Draft page 196

<sup>149</sup> [JHK\_BURNEY\_00373392-JHK\_BURNEY\_00373402] JH Kelly February 2018 Delay Claim exhibit 10

- 6.8 However, as discussed above, the as-planned versus as-built windows analysis places more emphasis on what actually happened and the baseline schedule is only used to measure delay against rather than a determination of criticality. I also note that the methodology is *“less reliant on programming software and usually applied when there is concern over the validity or reasonableness of the baseline programme and/or contemporaneously updated programmes and/or where there are too few contemporaneously updated programme.”*<sup>150</sup>
- 6.9 Given all of the above, it is my opinion that this schedule is the most suitable baseline schedule on the Project, and I have herein used it as a benchmark from which to measure delay to JH Kelly’s construction activities and have referred to it as the Construction Baseline Schedule.
- 6.10 While a valid critical path was not present in this Construction Baseline Schedule, it is my opinion that if the proper logical links had been made, the planned critical path would have been through the Auxiliary Building, as this building was planned to finish last and contained the most complex and labor intensive work.
- 6.11 I note that, based on their subcontract terms, JH Kelly was obligated to produce and submit construction schedules for its work. From the documents that have been made available to me, and as mentioned previously, it appears that JH Kelly failed to issue monthly schedules on a consistent basis. Had JH Kelly properly maintained the schedule, the schedules could have been used to verify the critical path.
- 6.12 A graphical representation of the Construction Baseline schedule is shown on the following page at Figure 6-1.<sup>151</sup>

Case 4:50-cv-02387-H2C Document 550-3 Filed 04/15/25 Page 67 of 145

---

<sup>150</sup> SCL Delay Protocol 2<sup>nd</sup> Edition Paragraph 11.6

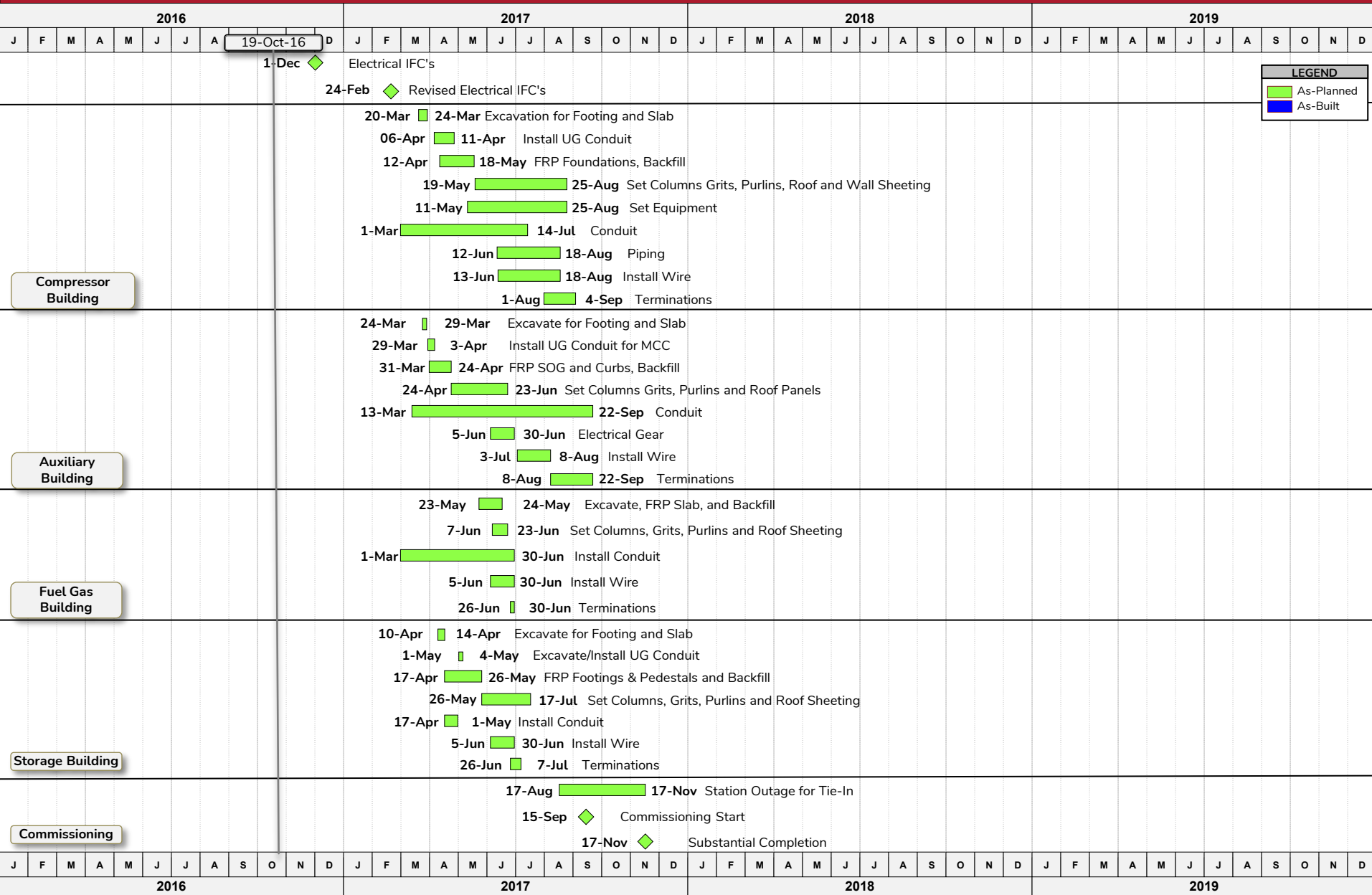
<sup>151</sup> It is noted that the Baseline Schedule was transmitted to PG&E in a pdf format. Upon review of the electronic format of this schedule, it is evident that it is missing key logical links and many of the activities are open ended. This has the effect of giving certain activities and areas more float that is reasonable. I have therefore based delay measurements from the early dates in the schedule as these were the dates given to PG&E.

# Burney Compressor Station K-2 Replacement Project

## Construction Baseline Schedule

Case 4:20-cv-05381-HSG Document 220-3 Filed 04/21/22 Page 62 of 142

Figure 6-1



LEGEND

■ As-Planned

■ As-Built

### The Actual Sequence of Construction

- 6.13 In my opinion, the initial actual critical path for Phase 2 ran through the completion of the remaining electrical Phase 1 design submittals that were still outstanding as at the beginning of the construction work (and which were discussed in Section 5 of this report) as JH Kelly could not progress with the excavation or fabrication of the underground electrical work until it had received the revised IFC Electrical design.
- 6.14 I note that this opinion is also shared by AECOM's Electrical Lead, Mr. Goward, who stated in his deposition that due to PG&E's changes, the design was issued piecemeal to support the first construction activities (i.e., underground electrical conduit).<sup>152</sup>
- 6.15 To that end, and as discussed previously, AECOM issued the IFC Conduit layout changes on 5 May 2017.<sup>153</sup> It was at this point in time, that JH Kelly could commence fabricating the underground conduit for the Auxiliary Building.
- 6.16 As discussed in detail in Section 5 of this report, PG&E's new design criteria made the below grade electrical work even more complex than it already was. This was discussed by Mr. Goward in his deposition as seen below:

***"Putting everything underground and having to pinpoint exactly where those stub-ups need to go is absurd. Normally you would have the contractor, like JH Kelly, field route the conduit or install it on wherever -- above grade. So that changed the layout of the building because all of a sudden we're thinking about bringing conduit under the slab and what's the most convenient location with different panels and how do we make all of this work."***<sup>154</sup>

- 6.17 It is also my understanding that Mr. Lewis discusses the impacts of these changes in his expert report.
- 6.18 As will be shown, the first delivery of the underground conduit for the Auxiliary Building was made on 1 June 2017.<sup>155</sup> With this delivery, JH Kelly immediately began installing the underground conduit.<sup>156</sup> Given that, according to the Construction Baseline Schedule, this work was planned to commence on 29 March 2017, this means that the Project was **64 days in delay at this point in time**

---

<sup>152</sup> See Dean Goward deposition page 87 and 88

<sup>153</sup> See Dean Goward deposition Exhibit 67

<sup>154</sup> See Dean Goward deposition page 83

<sup>155</sup> [AEC00289331-AEC00289339] See AECOM Daily Report of 1 June 2017

<sup>156</sup> [AEC00289331-AEC00289339] See AECOM Daily Report of 1 June 2017

- (1 June 2017 – 29 March 2017 = 64 days). In my opinion, this delay is attributable to the late issuance of the IFC Conduit drawing for the Auxiliary Building which was impacted by both PG&E’s preferential design changes as well as the need to reroute the duct bank around the existing utility conflict.
- 6.19 Upon commencing excavations, JH Kelly encountered boulders which hindered their excavation.<sup>157</sup> Once the rock was cleared, JH Kelly continued the installations of the underground conduit beneath the Auxiliary Building and substantially completed this work on 17 July 2017 - **105 days later than planned** (17 July 2017 – 3 April 2017 = 104 days).<sup>158</sup>
- 6.20 Once the conduit below the Auxiliary Building was complete, JH Kelly advanced the foundations and steel structure above. JH Kelly added extra shifts for this Auxiliary Building work and was able to dry-in the building by 28 September 2017.<sup>159</sup>
- 6.21 While JH Kelly was able to progress the Auxiliary Building structure, the duct bank work (which consists of underground conduit runs encased in reinforced concrete) became delayed due to the increased complexity and scope that was a result of PG&E’s preferential changes to the Electrical design (discussed in Section 5).
- 6.22 As discussed in the deposition of JH Kelly’s Mr. Lee:
- “The electrical design was released piecemeal from a duct bank perspective because the duct banks come up inside of the auxiliary building and really are the start of the control network for the entire site. So laying that logic through the project is main critical path.”<sup>160</sup>*
- 6.23 Once the duct banks were substantially complete on 16 December 2017, the critical path shifted into the testing and terminations within the Auxiliary Building. At this point in time, Phase 2 was **130 days in delay** (16 December 2017 - 8 August 2017 = 130 days).<sup>161</sup>
- 6.24 After an agreed 12-day Project Shut Down over the winter holidays (between 22 December 2017 and 2 January 2018), JH Kelly continued progressing the electrical terminations.<sup>162</sup> As it turns out, JH Kelly lost time in completing the electrical terminations as the work was more labor intensive than originally contemplated. Consequently, JH Kelly was only 30% complete when the critical path shifted

<sup>157</sup> [JHK\_BURNEY\_00337202-JHK\_BURNEY\_00337203] See JH Kelly Daily report of 6 June 2017

<sup>158</sup> [AEC00297894-AEC00297902] See AECOM daily report of 18 July 2017

<sup>159</sup> See As-Built Schedule Activity id ARCH00180 “Install Roof Panels/Insulation/Liner - Auxiliary Building”

<sup>160</sup> See Draft Deposition of Tom Lee Vol 2 page 36-37

<sup>161</sup> [JHK\_BURNEY\_00167348-JHK\_BURNEY\_00167354] See JH Kelly Daily Report of 16 December 2017

<sup>162</sup> [BURNEY000371663] Progress as reported in AECOM’s February 2018 monthly report, Page 47/138

to the Commissioning phase on 2 February 2018 – **150 days later than planned** (2 February 2018 – 5 September 2017 = 150 days).<sup>163</sup>

- 6.25 Around this time, AECOM developed a Commissioning Schedule (as discussed in Section 4 above) which showed a completion date of 16 April 2018. Given this date, the Commissioning Schedule showed a delay 150 days matching the delay above (16 April 2018 - 17 November 2017 = 150 days).
- 6.26 It is therefore my opinion that after 2 February 2018, the critical path switched into the commissioning work. I note that my analysis for this work is contained in Section 7 of this report.
- 6.27 Figure 6-2 on the following page graphically illustrates the actual critical path for the Construction work. It is noted that, JH Kelly has taken a similar position with respect to the critical path as shown in their February 2018 delay analysis.<sup>164</sup>

### Periods of Performance

- 6.28 To assist in the discussion and analysis of delays, I have broken the total period of performance into 4-time windows as can be seen in the table below. These time windows were established based on revisions to the planned sequence of construction, key events and shifts in the critical path.

| Window | Description   | Time Frame                 |
|--------|---|----------------------------|
| I      | Start of the Underground Conduit for the Aux Building | 17 Oct 2016 to 1 Jun 2017  |
| II     | Underground Conduit Excavation                        | 1 Jun 2017 to 17 Jul 2017  |
| III    | Installation of Underground Duct Banks                | 17 Jul 2017 to 16 Dec 2017 |
| IV     | Terminations and Testing                              | 16 Dec 2017 to 2 Feb 2018  |

- 6.29 I discuss the above Windows in detail below and for each one I consider:

- a) The start and finish date of that window and the critical delay at the start and finish date of each window;
- b) The critical path during each window;
- c) The performance of the works during each period; and
- d) The primary cause(s) of delay during each window.

- 6.30 The as-built performance of the Construction works can be seen in Figure 6-2 below.

<sup>163</sup> [BURNEY000371663] Progress as reported in AECOM's February 2018 monthly report, Page 47/138

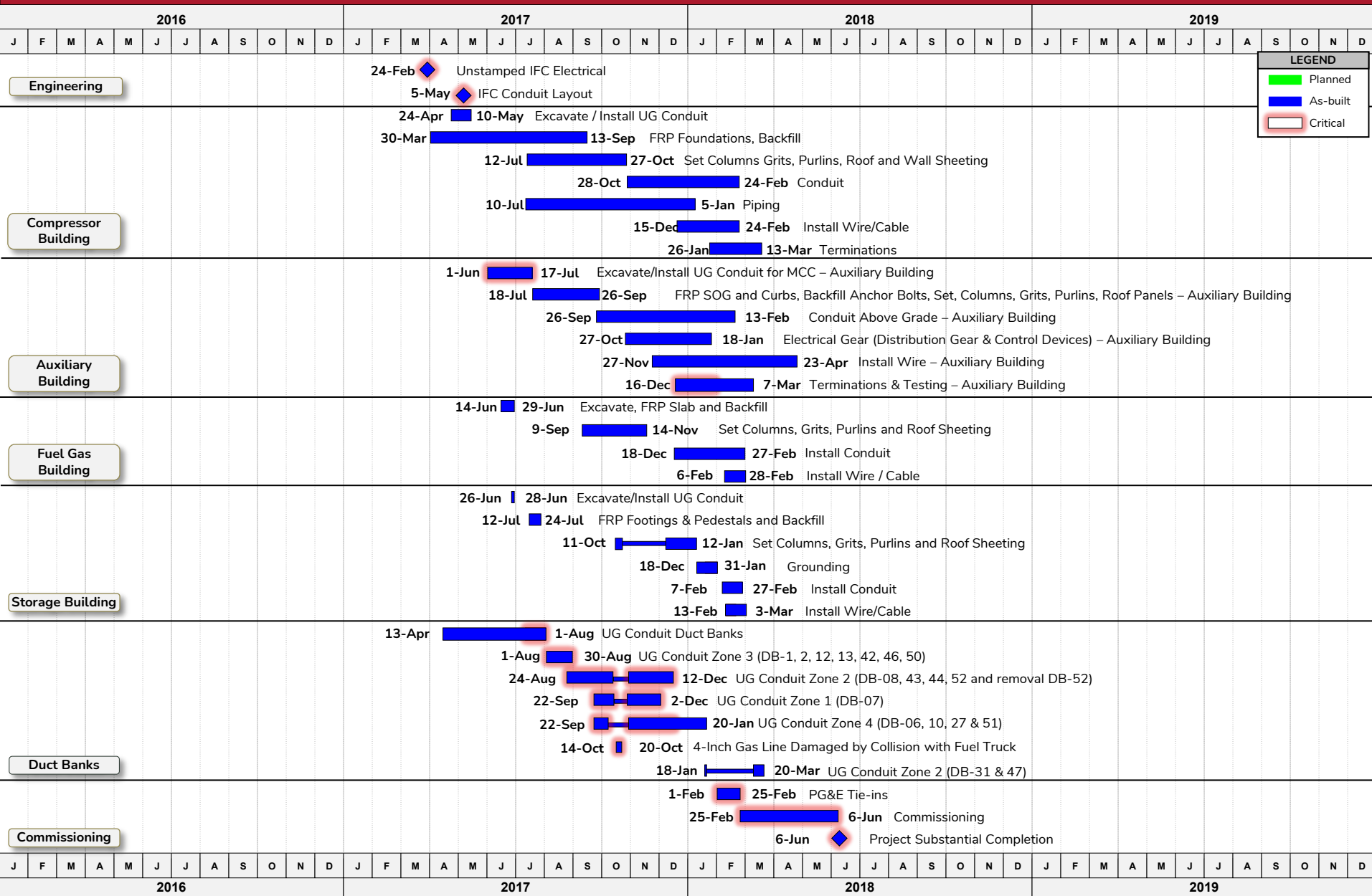
<sup>164</sup> [JHK\_BURNEY\_00373208-JHK\_BURNEY\_00373266] JH Kelly February 2018 delay claim

# Burney Compressor Station K-2 Replacement Project

## Actual Critical Path for Construction

Case 4:20-cv-05381-HSG Document 220-3 Filed 04/21/22 Page 66 of 142

Figure 6-2



## Phase 2 Window I – Start of the UG Conduit for the Aux Bldg. (17 Oct 2016 to 1 Jun 2017)

### *Introduction*

- 6.31 At the end of Phase 1, AECOM was expecting to complete the IFC Electrical design package by 24 February 2017.<sup>165</sup> According to the January 2017 Schedule Update, if this date could be maintained, then Substantial Completion of Phase 2 could still be achieved by 17 November 2017 despite the delays to Phase 1.<sup>166</sup>
- 6.32 On 6 March 2017, while PG&E continued to make the changes to the Electrical design, JH Kelly and AECOM field staff mobilized to site for Phase 2 construction work.<sup>167</sup>
- 6.33 Due to PG&E's new design criteria (which was formalized between March and May 2017 as discussed in Section 5 of this report above), AECOM was not able to issue the full IFC Conduit layout drawing (which included the detail for the Auxiliary Building) until 5 May 2017.<sup>168</sup> While this did not constitute the complete IFC Electrical design package, the issuance of this IFC Conduit layout drawing was sufficient for JH Kelly to commence fabrication of the underground conduit for the critical Auxiliary Building.
- 6.34 After fabricating the underground conduit, JH Kelly was able to commence installation under the Auxiliary Building on 1 June 2017.<sup>169</sup>
- 6.35 In terms of critical delay in this time window:
- The beginning of this time window, 17 October 2016, is the date of AECOM's Contract with JH Kelly;
  - According to the Construction Baseline Schedule, the excavation and installation of the underground conduit for the Auxiliary Building was planned to commence on 29 March 2017;<sup>170</sup>
  - According to the daily reports, the excavation and installation of the underground conduit for the Auxiliary Building did not commence until 1 June 2017<sup>171</sup> – **64 calendar days later than planned** (1 June 2017 – 29 March 2017 = 64 days); and

<sup>165</sup> [BURNEY000298833-BURNEY000298983] See AECOM Monthly Report for January 2018

<sup>166</sup> [BURNEY000298833-BURNEY000298983] See AECOM Monthly Report for January 2018

<sup>167</sup> [BURNEY000081842] See March 2017 Monthly Report page 13

<sup>168</sup> [JHK\_BURNEY\_00158253-JHK\_BURNEY\_00158254] See Summary Log of E&I IFC Drawings at exhibit 5 of JH Kelly electrical TIA

<sup>169</sup> I note that, only layout and survey work for the Auxiliary building trenches were carried out prior to this date

<sup>170</sup> Baseline Schedule Activity ID: A2510 "Install underground conduit for MCC"

<sup>171</sup> [AEC00289331-AEC00289339] See AECOM Daily Report for 1 June 2017

d) The Project therefore was delayed **64 calendar days in this time period.**

6.36 From my review of the contemporaneous documents and the progress achieved during this time, the principal cause(s) of critical delay in this window appear to have been as follows:

- a) PG&E's preferential changes to the Electrical design; and
- b) Conflict between the duct bank and the existing utility.

***PG&E's Preferential Changes to the Electrical Design***

6.37 On 6 March 2017, while PG&E continued to make the changes to the Electrical design discussed in Section 5 of this report, JH Kelly and AECOM field staff mobilized to site for Phase 2 construction work.<sup>172</sup>

6.38 The next day, on 7 March 2017, JH Kelly's earthworks subcontractor (Meyers) also mobilized to site.<sup>173</sup> Meyers in fact commenced excavations for the Compressor pad on 13 March 2017 as can be seen below.<sup>174</sup>



**Figure 6-3: Excavation for the Compressor pad on 13 March 2017<sup>175</sup>**

<sup>172</sup> [BURNEY000081842] See March 2017 Monthly Report page 13

<sup>173</sup> [BURNEY000081842] See March 2017 Monthly Report page 13

<sup>174</sup> [BURNEY000081842] See March 2017 Monthly Report page 13

<sup>175</sup> [BURNEY000110569] See April 2017 monthly report page 16

- 6.39 While JK Kelly could commence the excavation work, they could not commence the installation of the underground conduit as they were still waiting on the IFC Conduit drawings. In fact, it was not until 21 March 2017 that JH Kelly received electrical IFC drawings for the Compressor Building and valve houses.<sup>176</sup>
- 6.40 In an attempt to mitigate the delay to the drawings, AECOM authorized JH Kelly to work overtime to expedite deliveries of prefabricated conduit.<sup>177</sup> To that end, the first prefabricated conduit racks were delivered to the site on 11 April 2017 as shown in the image below.<sup>178</sup>



**Figure 6-4: First conduit delivery for the Compressor Building and Valve Houses on 11 April 2017<sup>179</sup>**

- 6.41 According to the Construction Baseline Schedule, JH Kelly actually planned to be completing the underground conduit for the Compressor Building on 11 April 2017 not only just commencing it.<sup>180</sup>

<sup>176</sup> [AEC00658845-AEC00658848] Notice of Delay and Cost Impacts (Burney) 6-12-2017

<sup>177</sup> [AEC00658845-AEC00658848] Notice of Delay and Cost Impacts (Burney) 6-12-2017

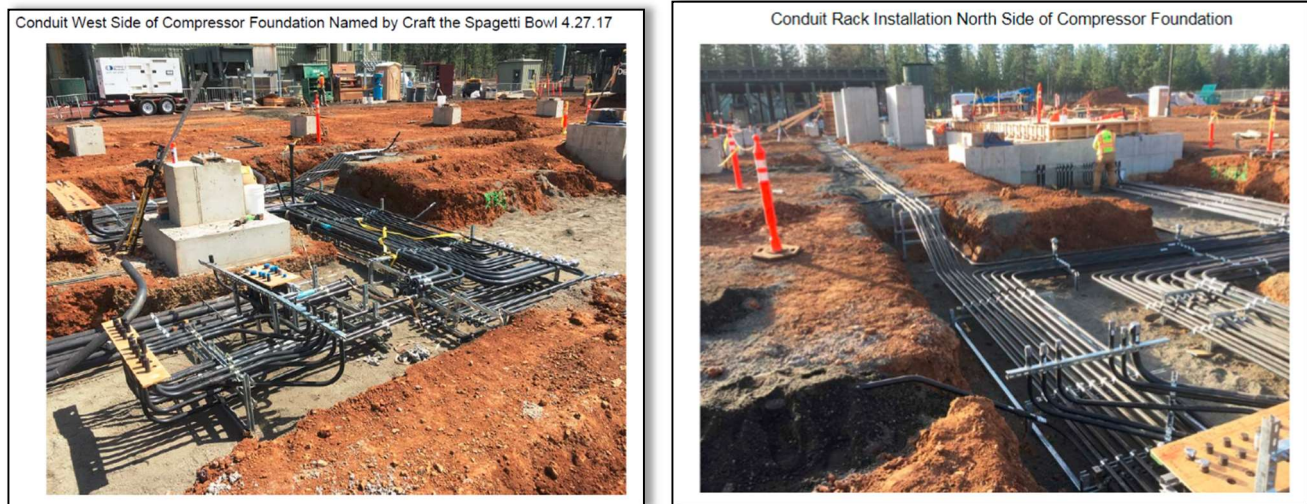
<sup>178</sup> [BURNEY000110569] See April 2017 monthly report page 15

<sup>179</sup> [BURNEY000110569] See April 2017 monthly report page 15

<sup>180</sup> See Baseline Schedule Activity ID "A1190" Install underground conduit

6.42 Moreover, while JH Kelly was finally able to commence the underground conduit work at the Compressor Building, they were still on hold at the critical Auxiliary Building. Given that, according to the Construction Baseline Schedule, the Auxiliary Building was planned to commence before the Compressor building, it means that the Auxiliary Building was actually the most in delay.

6.43 While they waited for the IFC Conduit layout drawing for the Auxiliary Building, JH Kelly progressed the Compressor Building underground electrical work as shown in the progress photos below.



**Figure 6-5: 27 April and 2 May 2017 Progress photo for the Compressor Area<sup>181 182</sup>**

6.44 As it turns out, due to PG&E's new design criteria (discussed in Section 5 above), AECOM was not able to issue the IFC Conduit layout for the Auxiliary Building until 5 May 2017.<sup>183</sup> PG&E approved the layout that same day.<sup>184</sup> With the approved drawing, JH Kelly could finally commence prefabricating the underground conduit for the Auxiliary Building.

6.45 Meanwhile, JH Kelly was able to substantially complete the below grade electrical work for the Compressor Building, pour the Compressor Building slab and set the compressor by 11 May 2017 as shown in the progress photo below.

[Case 4:50-cv-02387-H2C Document 550-3 Filed 04/15/22 Page 10 of 145](#)

<sup>181</sup> [AEC00328663-AEC00328671] See AECOM Daily Report for 27 April 2017

<sup>182</sup> [AEC00277297-AEC00277306] See AECOM Daily Report for 2 May 2017

<sup>183</sup> See Goward Deposition Exhibit 67

<sup>184</sup> See Goward Deposition Exhibit 67



**Figure 6-6: 11 May Progress photo for the Compressor Area<sup>185</sup>**

6.46 At the same time, JH Kelly was able to complete the Auxiliary Building footings as shown in the figure below.



**Figure 6-7: Auxiliary Building footings at 8 May 2017<sup>186</sup>**

<sup>185</sup> [AEC00374129-AEC00374139] See AECOM Daily Report for 11 May 2017

<sup>186</sup> [AEC00309840-AEC00309850] See AECOM Daily Report of 8 May 2017

6.47 On 10 May 2017, shortly after receiving the Auxiliary Building IFC Conduit layout, it was recorded in meeting minutes that JH Kelly informed AECOM that the:

***“Conduit for the Auxiliary building is still 2 to 3 weeks away from delivery from Longview WA”.***<sup>187</sup>

6.48 Meanwhile, JH Kelly began installing duct bank sections between various buildings as shown in the progress photos below.



**Figures 6-8: Progress Photos of duct banks (not underneath buildings) as at 16 May 2017**<sup>188</sup>

6.49 It was later recorded in the meeting minutes of 17 May 2017 that:

***“JH Kelly big push is for auxiliary building conduit. The deep conduits have not shipped yet. A substantial amount of conduit has been fabricated, but many still need to be put in racks. Site delivery date is forecast for May 31st”.***<sup>189</sup>

6.50 By 23 May 2017, JH Kelly commenced the duct bank leading up to the Auxiliary Building as shown in the photo below.<sup>190</sup>

[Case 4:50-cv-02387-H2C Document 550-3 Filed 04/15/21 Page 15 of 145](#)

<sup>187</sup> [BURNEY000232087-BURNEY000232091] 2017-05-10-BURNEY K2 MEETING MINUTES

<sup>188</sup> [AEC00280390-AEC00280399] See AECOM Daily Report of 16 May 2017

<sup>189</sup> [JHK\_BURNEY\_00023303-JHK\_BURNEY\_00023305] 2017-05-17-BURNEY K2 MEETING MINUTES

<sup>190</sup> [AEC00321448-AEC00321457] See AECOM Daily Report of 23 May 2017



**Figure 6-9: Progress Photo of duct banks reacing Auxiliary Building as at 23 May 2017<sup>191</sup>**

6.51 It was recorded in the minutes of a meeting on 24 May that:

“JHK Longview shop has developed a model for the conduit installation in the auxiliary building showing how the conduit will be sequenced for fabrication, shipping, and installation. There will be about 5,000 feet of conduit built in 15 modules for delivery and installation from the end of May to the end of June.”<sup>192</sup>

6.52 According to the as-built record, the first delivery of conduit for the Auxiliary Building arrived on 1 June 2017.<sup>193</sup> As can be seen in the figure below, some of the conduit was immediately installed under the Auxiliary Building.

Case 4:50-cv-02387-H2C Document 550-3 Filed 04/15/21 Page 13 of 145

<sup>191</sup> [AEC00321448-AEC00321457] See AECOM Daily Report of 23 May 2017

<sup>192</sup> [JHK\_BURNEY\_00023321-JHK\_BURNEY\_00023323] 2017-05-24-BURNEY K2 MEETING MINUTES

<sup>193</sup> [JHK\_BURNEY\_00337166-JHK\_BURNEY\_00337167] JH Kelly Daily Report of 1 June 2017



**Figure 6-10: Progress Photo of first conduit rack beneath Auxiliary Building as at 1 June 2017<sup>194</sup>**

***Conflict between the duct bank and the existing utility***

- 6.53 As discussed previously, a conflict between a proposed duct bank and an existing utility (a 34" gas line) was discovered upon the submission of the unstamped Electrical design issued on 24 February 2017.
- 6.54 Mr. Lewis has noted that the conflict between the new duct bank location and the existing underground gas lines were shown on AECOM's 30%, 60% and 90% drawings. Despite this, and my understanding that JH Kelly had a responsibility to provide constructability reviews of AECOM's incremental design drawings, JH Kelly failed to notify AECOM of construction concerns with these conflicts until March 2017.<sup>195</sup> As a result, the redesign of the duct bank in the area of the cooler facility had a larger impact on the issuance of the IFC drawings than it otherwise should have and specifically was a cause of delay to the issuance of the IFC Conduit layout for the Auxiliary building.

<sup>194</sup> [AEC00289331-AEC00289339] See AECOM Daily Report of 1 June 2017

<sup>195</sup> [BURNEY000075209] Contract between AECOM and PG&E Art. 1.4.1, 2.2.1, 2.17. See also JHK0050723-70 Pg 3, item 7 – lists and Pg 15.

### Conclusion

- 6.55 According to the Construction Baseline Schedule, JH Kelly should have commenced excavation and installation for the Auxiliary Building conduit installation on 24 March 2017. Given this date, the Project was therefore 64 days behind schedule when JH Kelly actually commenced this work on 1 June 2017 (1 June 2017 – 29 March 2017 = 64 days).
- 6.56 In my opinion, this delay is attributable to the late issuance of the IFC Conduit drawing for the Auxiliary Building which was impacted by both PG&E's preferential design changes as well as the need to reroute the duct bank around the existing utility conflict. Should it be found that JH Kelly was responsible for catching the conflict earlier than they did, then they would share accountability for the delay. For purposes of this report, I assumed this to be the case. However, based on the records that have been made available to me, I have not been able to determine exactly when the change to routing of the duct bank was made. I have therefore split the delay equally between PG&E and JH Kelly (i.e., 32 days to PG&E and 32 days to JH Kelly) as it seems that approximately half of the added duct bank is related to the rerouting around the existing conflict.
- 6.57 The table below summarizes the actual delay incurred in Phase 2 Window I. The delay during this time period is also illustrated in Figure 6-11 on the following page.

| Phase 2 Window | Cause of Delay   | Delay in Window (Days) |
|----------------|--|------------------------|
| I              | PG&E's Preferential Changes to the Electrical Design and the conflict between the duct bank and the existing utility (PG&E and JH Kelly) | 64                     |
| <b>Total</b>   |  | <b>64</b>              |

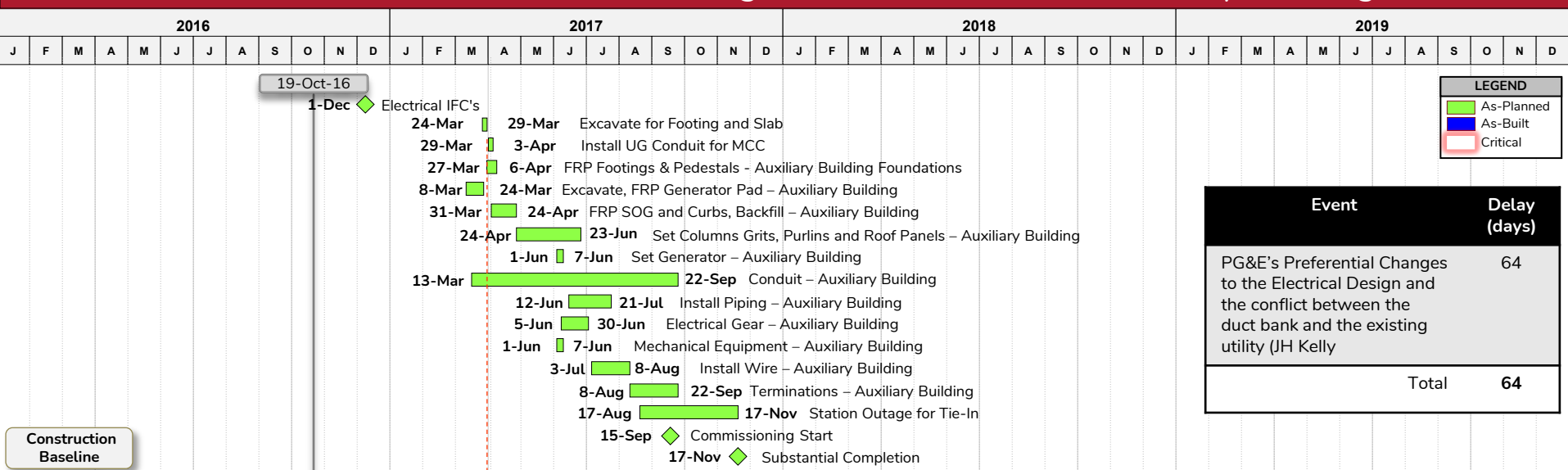
CASE 4:50-cv-02387-H2C Document 550-3 Filed 04/15/25 Page 12 of 145

# Burney Compression Station K-2 Replacement Project

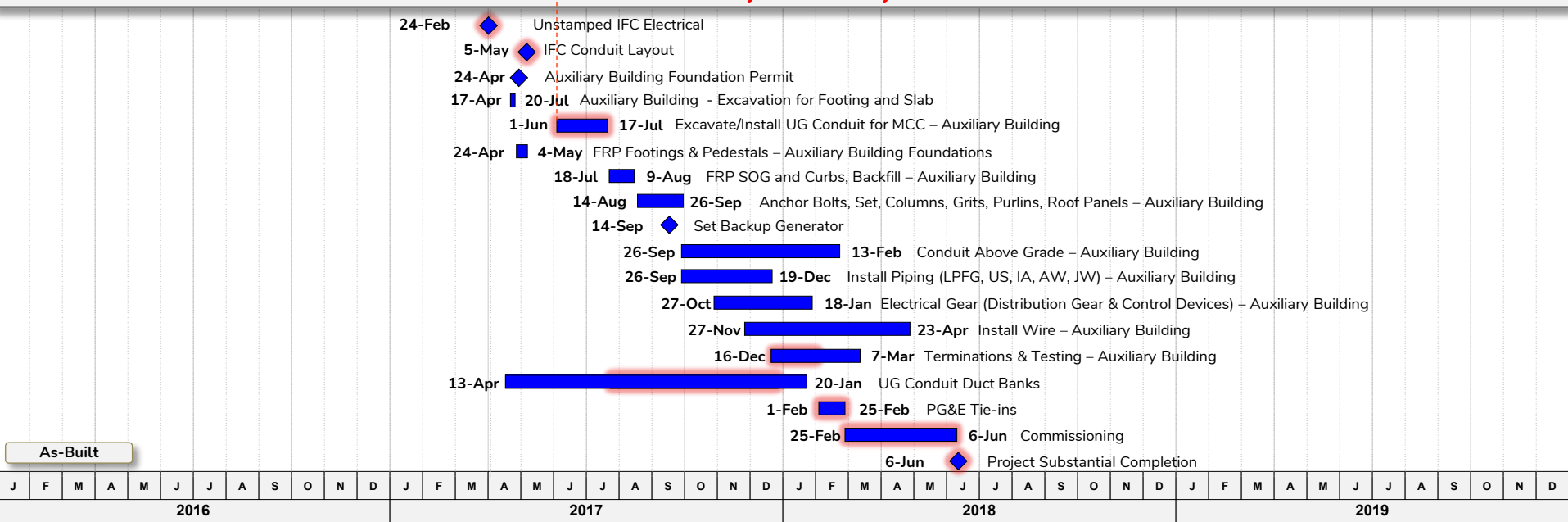
Case 4:20-cv-05381-HSG Document 220-3 Filed 04/21/22 Page 76 of 142

## Phase II Window I – Start of Underground Conduit for the Auxiliary Building

Figure 6-11



**Total Delay = 64 Days**



## Phase 2 Window II – UG Conduit Installation (1 Jun 2017 to 17 Jul 2017)

### *Introduction*

- 6.58 Upon commencing the excavations for underground conduit work at the Auxiliary Building, JH Kelly took longer than planned to complete this work.
- 6.59 In my opinion, this extended duration was due to the discovery of boulders during excavation, the additional scope from PG&E's change in design, and JH Kelly's slower than planned progress.
- 6.60 In terms of critical delay in this time window:
- a) At the beginning of this time window (i.e., on 1 June 2017), the Project was 64 calendar days behind schedule;
  - b) According to the Construction Baseline Schedule, JH Kelly planned to complete the installation of the underground conduit for the Auxiliary Building such that it could commence the Auxiliary Building FRP slab work by 31 March 2017.<sup>196</sup>
  - c) Due to a number of reasons discussed herein, JH Kelly did not actually complete the underground conduit for the Auxiliary Building until 17 July 2017<sup>197</sup> – **105 calendar days later than planned** (17 July 2017 – 3 April 2017 = 105 days); and
  - d) The Project therefore was delayed **a total of 41 calendar days in this time period** (105 days – 64 days = 41 days).
- 6.61 From my review of the contemporaneous documents and the progress achieved during this time, the principal cause(s) of critical delay in this window appear to have been as follows:
- a) Discovery of Boulders;
  - b) Increased underground conduit as a result of PG&E's preferential electrical changes; and
  - c) Slower than planned progress installing the underground conduit underneath the Auxiliary Building.

### *Discovery of Boulders*

- 6.62 At the end of the previous time period (i.e., 1 June 2017), JH Kelly commenced installation of the underground conduit for the Auxiliary Building. On that same day, large boulders were discovered as shown in the figures below.

<sup>196</sup> See Baseline Schedule Activity ID: A2530 "Form, Rebar, Pour interior slab section 1"

<sup>197</sup> See As-Built Schedule Activity ID "ELEC00090" Excavate/Install UG Conduit for MCC - Auxiliary Building"



**Figure 6-12: Boulders found in Auxiliary Building between column lines 1 and 2 on 1 June 2017<sup>198</sup>**

6.63 Once these boulders were removed, the bedding and first conduit rack sections in this area were set in place as shown in the figures below.



**Figure 6-13: Bedding and first conduit rack placed between column lines 1 and 2 on 5 June 2017<sup>199</sup>**

6.64 On 5 June (the second day of excavation) rock was again found as shown in the figures below.<sup>200</sup>

[Case 4:50-cv-02387-H2C Document 550-3 Filed 04/15/25 Page 18 of 145](#)

<sup>198</sup> [AEC00289331-AEC00289339] See AECOM daily report of 1 June 2017

<sup>199</sup> [AEC00289331-AEC00289339] See AECOM daily report of 1 June 2017

<sup>200</sup> [AEC00355038-AEC00355046] See AECOM daily report of 5 June 2017



**Figure 6-14: Boulders found in Auxiliary Building between column lines 2 and 3<sup>201</sup>**

6.65 As can be seen from the figures above, JH Kelly was installing conduit as the rocks were removed. JH Kelly continued to remove rock on 6 and 7 June 2017 as shown in the site progress photos below.<sup>202203</sup>



**Figure 6-15: Progress Photos from boulders / rock excavations at Auxiliary Building on 6 and 7 June 2017<sup>204 205</sup>**

6.66 By 12 June, AECOM was reporting that the last sections of rock were broken up as shown in the figures below.<sup>206</sup>

<sup>201</sup> [AEC00355038-AEC00355046] See AECOM daily report of 5 June 2017

<sup>202</sup> [AEC00309534-AEC00309541] See AECOM daily report of 6 June 2017

<sup>203</sup> [AEC00307280-AEC00307288] See AECOM daily report of 7 June 2017

<sup>204</sup> [AEC00309534-AEC00309541] See AECOM daily report of 6 June 2017

<sup>205</sup> [AEC00307280-AEC00307288] See AECOM daily report of 7 June 2017

<sup>206</sup> [AEC00373159-AEC00373167] See AECOM daily report of 12 June 2017



**Figure 6-16: Hydraulic Ram Hammer breaking up last remaining rock on 12 June 2017<sup>207</sup>**

6.67 JH Kelly contemporaneously noted that the rock in the Auxiliary Building hindered their work until 12 June 2017 and that there were several days in which Meyers spent 10 hours (i.e., a full day) removing rock.<sup>208 209 210</sup>

6.68 According to the Construction Baseline Schedule, the excavations were planned to take 5 days (24 March to 29 March 2017). However, due to the discovery of boulders, this excavation work actually took 12 days (1 June to 12 June 2017 inclusive). Therefore, 7 days of delay during the excavation works were caused by the discovery of boulders (12 days – 5 days = 7 days).

6.69 It is my understanding that the discovery of boulders is an unforeseen condition and is therefore attributable to PG&E.<sup>211</sup>

#### ***Increased Underground Conduit as a result of PG&E's Preferential Electrical Changes***

6.70 As mentioned previously, PG&E's new design criteria impacted the underground conduit for the Auxiliary Building. Not only did this redesign impact the start of the underground conduit work, it also created additional scope by increasing the size and depth of the duct banks and also adding additional duct bank runs (as seen in the figure below).<sup>212</sup>

<sup>207</sup> [AEC00373159-AEC00373167] See AECOM daily report of 12 June 2017

<sup>208</sup> [JHK\_BURNEY\_00337202-JHK\_BURNEY\_00337203] See JH Kelly Daily report of 6 June 2017

<sup>209</sup> [JHK\_BURNEY\_00337168-JHK\_BURNEY\_00337169] See JH Kelly Daily report of 7 June 2017

<sup>210</sup> [JHK\_BURNEY\_00368307-JHK\_BURNEY\_00368308] See JH Kelly Daily report of 12 June 2017

<sup>211</sup> [BURNEY000501981\_PGEProductionVOL003] AECOM Bid assumptions

<sup>212</sup> [JHK\_BURNEY\_00383758 (Graphic 2), JHK\_BURNEY\_00383791 (Ex. 6)] JH Kelly Revised Delay Claim

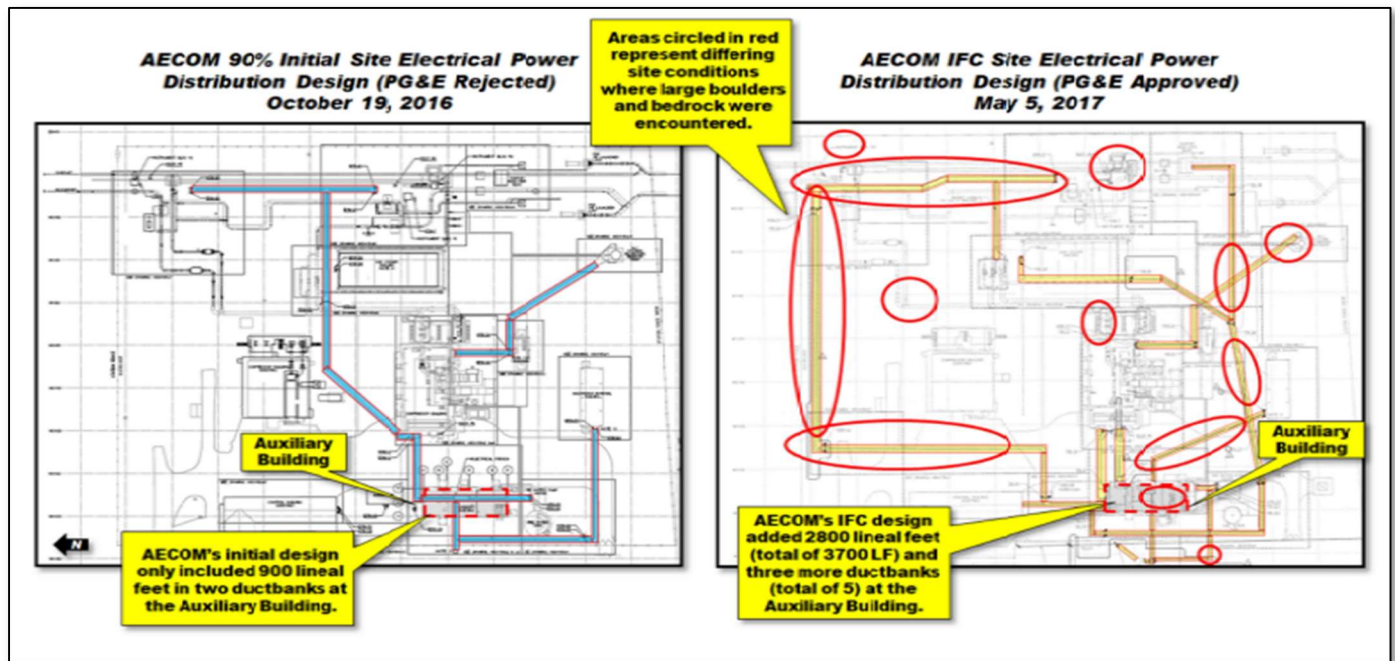


Figure 6-17: Pre IFC Additional Scope<sup>213</sup>

- 6.71 It is my understanding that the 90% initial Electrical design (on which the Construction Baseline Schedule was developed) included 900 lf of conduit underneath the Auxiliary Building.<sup>214</sup> According to the Construction Baseline Schedule, JH Kelly planned to complete this work in 4 workdays (between 29 March and 3 April 2017). This equates to a productivity rate of 225 lf of conduit per day (900 lf / 4 days = 225 lf/day).
- 6.72 It is also my understanding that the final IFC Electrical design added 2,800 lf of conduit underneath the Auxiliary Building (for a total of 3,800 lf).<sup>215</sup> Using JH Kelly's planned productivity rate (as described above), this means the added work should have taken an additional 19 days to complete (2,800 lf / 225 lf per day = 19 days).
- 6.73 As this additional work is a direct result of PG&E's preferential changes, I have attributed this delay to PG&E.

<sup>213</sup> [JHK\_BURNEY\_00383758 (Graphic 2), JHK\_BURNEY\_00383791 (Ex. 6)] JH Kelly Revised Delay Claim

<sup>214</sup> [JHK\_BURNEY\_00383758 (Graphic 2), JHK\_BURNEY\_00383791 (Ex. 6)] JH Kelly Revised Delay Claim

<sup>215</sup> [JHK\_BURNEY\_00383758 (Graphic 2), JHK\_BURNEY\_00383791 (Ex. 6)] JH Kelly Revised Delay Claim

***Slower than planned progress installing the underground conduit underneath the Auxiliary Building***

6.74 Once the boulders had been removed, JH Kelly recommenced installing the underground conduit underneath the Auxiliary Building on 13 June 2017 as seen in the figures below.<sup>216</sup>



**Figure 6-18: Progress photos of Auxiliary Building underground conduit as at 13 and 14 June 2017<sup>217 218</sup>**

6.75 This work continued through the rest of June 2017 and into July 2017 as can be seen in the progress photos shown below.

Case 4:50-cv-02387-H2C Document 550-3 Filed 04/15/21 Page 85 of 145

<sup>216</sup> [AEC00331274-AEC00331282] See AECOM daily report of 13 June 2017

<sup>217</sup> [AEC00331274-AEC00331282] See AECOM daily report of 13 June 2017

<sup>218</sup> [AEC00338202-AEC00338210] See AECOM daily report of 14 June 2017



Figure 6-19: Progress Photos of Auxiliary Building underground conduit as at 15 and 19 June 2017<sup>219 220</sup>



Figure 6-20: Progress Photos of Auxiliary Building underground conduit as at 20 and 21 June 2017<sup>221 222</sup>

C926 4:50-CA-02387-H2C DOCUMENT 550-3 E1169 04/15/15 6906 83 01 J45

<sup>219</sup> [AEC00367024-AEC00367033] See AECOM daily report of 15 June 2017

<sup>220</sup> [AEC00284828-AEC00284836] See AECOM daily report of 19 June 2017

<sup>221</sup> [AEC00353578-AEC00353586] See AECOM daily report of 20 June 2017

<sup>222</sup> [AEC00352258-AEC00352267] See AECOM daily report of 21 June 2017



Figure 6-21: Progress Photos of Auxiliary Building underground conduit as at 26 and 29 June 2017<sup>223 224</sup>



Figure 6-22: Progress Photos of Auxiliary Building underground conduit as at 5 and 6 July 2017<sup>225 226</sup>

6.76 JK Kelly substantially completed this work on 17 July 2018 and began backfilling the Auxiliary Building

the next day (i.e., 18 July 2017) as seen in the progress photos below.

<sup>223</sup> [AEC00376346-AEC00376354] See AECOM daily report of 26 June 2017

<sup>224</sup> [AEC00340368-AEC00340374] See AECOM daily report of 29 June 2017

<sup>225</sup> [AEC00364374-AEC00364381] See AECOM daily report of 5 July 2017

<sup>226</sup> [AEC01020812-AEC01020819] See AECOM daily report of 6 July 2017

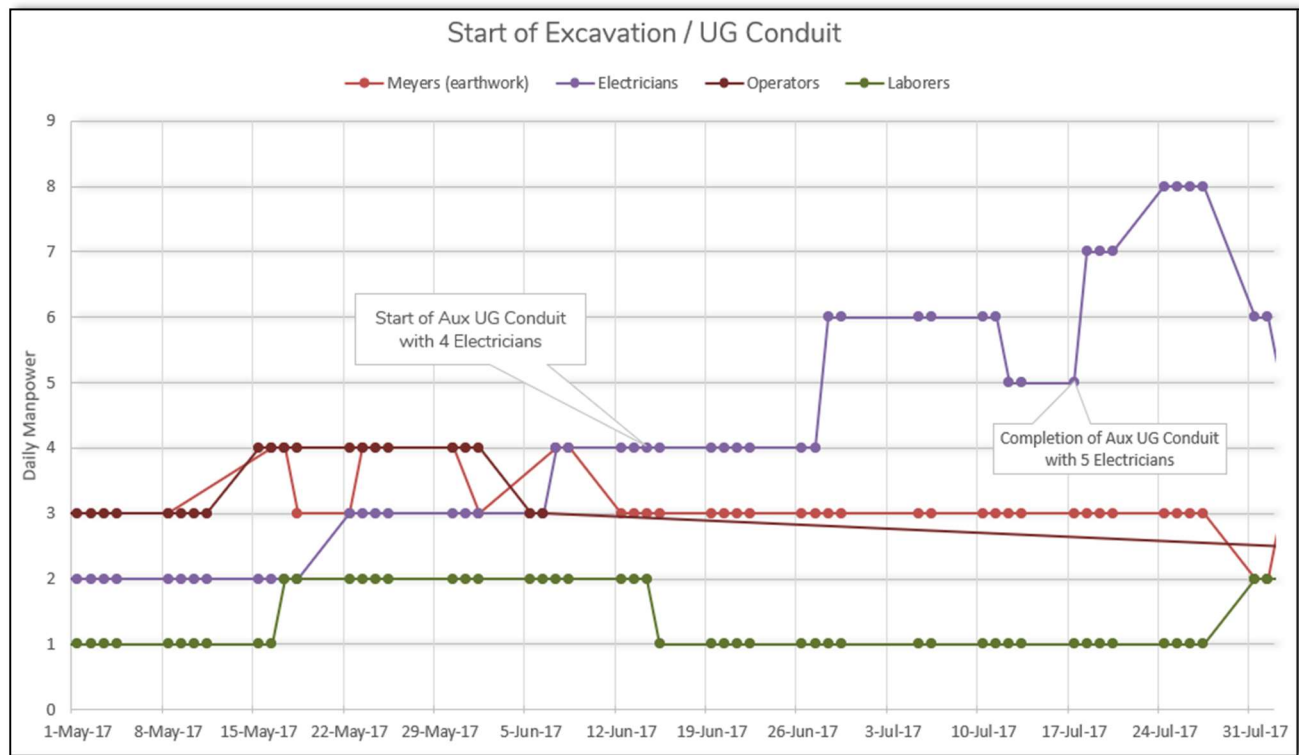


**Figure 6-23: Progress Photos of Auxiliary Building backfill over conduit 18 July 2017<sup>227</sup>**

- 6.77 Given the above dates, this means it actually took JH Kelly 47 calendar days to complete this work (18 July 2017 – 1 June 2017 = 47 days). Considering the planned duration of 6 calendar days to do this work (3 April 2017 – 29 March 2017), JH Kelly took 41 calendar days longer than originally anticipated (47 days – 6 days = 41 days).
- 6.78 Considering the 7-day delay caused by the Boulders and the 19-day delay caused by the additional scope (for a total of 26 days), this means that JH Kelly lost an additional 15 days of delay in this work (41 days – 26 days = 15 days).
- 6.79 From the documents that are available to me, it is unclear what caused this delay. I note that at the time the underground conduit started for the Auxiliary Building, JH Kelly only had 4 electricians on site to install conduit (as can be seen in the figure below). It is also clear from the figure below that more electricians were needed to complete this work as they were eventually added later.

CASE 4:50-cv-02387-H2C DOCUMENT 550-3 FILED OCT 15 2021 BY USDC SD CA

<sup>227</sup> [AEC00297894-AEC00297902] See AECOM daily report of 18 July 2017



**Figure 6-24: Manpower compiled from AECOM Daily Reports May to July 2017<sup>228</sup>**

- 6.80 A review of the daily reports, indicates that these workers were not installing conduit at the Auxiliary Building every day even though the schedule at the time (dated 9 July 2017), showed this work as critical. Instead, it seems the labor was moving around the site rather than focusing on critical work.
- 6.81 I also note that JH Kelly delivered the last prefabricated conduit assemblies on 6 July 2017 which is longer than they forecasted back on 17 May 2017 (when they stated in a meeting that the delivery would be made at the latest by 1 June 2017 as discussed previously).<sup>229</sup>
- 6.82 Based on all of the above, I have attributed this delay to JH Kelly's slower than planned productivity.

### Conclusion

- 6.83 Of the additional 41 calendar days it took to install the underground conduit for the Auxiliary Building:
- a) 7 calendar days can be attributed to the discovery of Boulders;
  - b) 19 calendar days can be attributed to the additional scope caused by PG&E's preferential electrical changes; and

<sup>228</sup> [Reports found in bates range AEC00277297 through AEC01066483] AECOM daily manpower reports from May 2017 to July 2017

<sup>229</sup> [JHK\_BURNEY\_00023303-JHK\_BURNEY\_00023305] 2017-05-17-BURNEY K2 MEETING MINUTES

- c) The remaining 15 days appear to be due to JH Kelly's slower than planned progress installing the underground conduit underneath the Auxiliary Building.

6.84 The table below summarizes the actual delay incurred in Phase 2 Window II. The delay during this time period is also illustrated in Figure 6-25 on the following page.

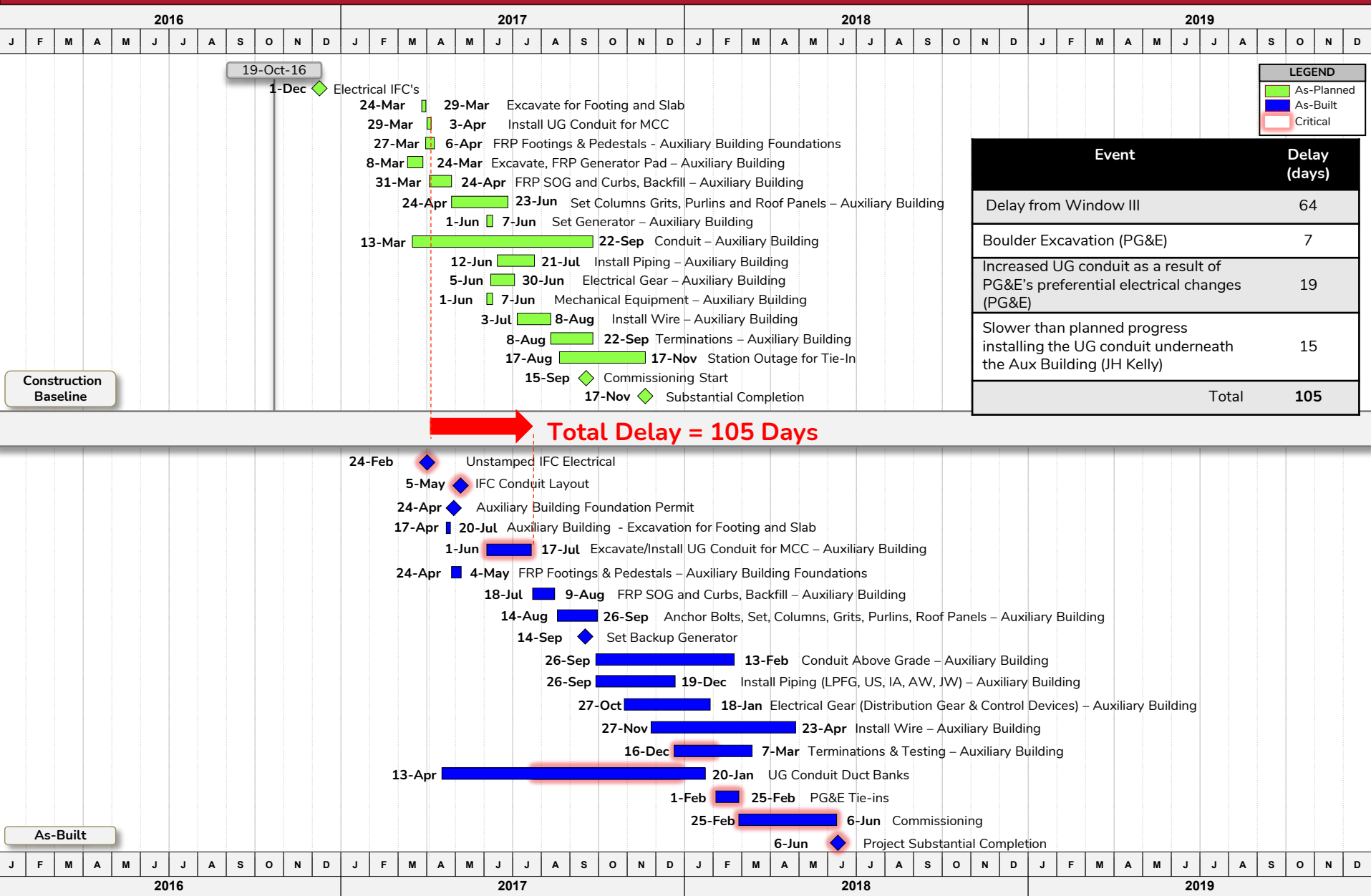
| Phase 2 Window | Cause of Delay   | Delay in Window (Days) |
|----------------|--|------------------------|
|                | Delays through Window I  | 64                     |
| II             | Boulder Excavation (PG&E)  | 7                      |
| II             | Increased underground conduit as a result of PG&E's preferential electrical changes (PG&E)                   | 19                     |
| II             | Slower than planned progress installing the underground conduit underneath the Auxiliary Building (JH Kelly) | 15                     |
|                | <b>Total</b>   | <b>105</b>             |

# Burney Compressor Station K-2 Replacement Project

## Phase II Window II – Underground Conduit Installation

Case 4:20-cv-05381-HSG Document 220-3 Filed 04/21/22 Page 88 of 142

Figure 6-25



## Phase 2 Window III – Installation of UG Duct Banks (18 Jul 2017 to 16 Dec 2017)

### *Introduction*

- 6.85 At the end of the previous window, JH Kelly had completed sufficient underground conduit to start backfilling the Auxiliary Building. Once the underground conduit was complete within the Auxiliary building, JH Kelly continued to make good progress in the Auxiliary building structure and as will be shown, JH Kelly was able to complete this work 14 days faster than planned. According to the Construction Baseline Schedule, once the Auxiliary building was dried-in, JH Kelly planned to complete conduit and terminations on 8 August 2017.<sup>230</sup>
- 6.86 However, despite this good progress in the Auxiliary Building, JH Kelly was delayed in other areas of the Project, namely the underground electrical conduit (i.e., duct banks). As it turns out, JH Kelly was unable to progress the electrical duct banks as planned and this work subsequently delayed the commencement of terminations in the Auxiliary Building until 16 December 2017.<sup>231</sup>
- 6.87 In terms of critical delay in this time window:
- a) At the beginning of this time window (i.e., on 18 July 2017), the Project was 105 calendar days behind schedule;
  - b) According to the Construction Baseline Schedule, JH Kelly planned to complete enough electrical work to commence terminations in the Auxiliary Building by 8 August 2017;<sup>232</sup>
  - c) Due to the additional and increased duct banks that were required due to PG&E's preferential electrical changes, JH Kelly was not actually able to substantially complete the duct banks and commence terminations and testing until 16 December 2017 - **130 calendar days later than planned** (16 December 2017 – 8 August 2017 = 130 days); and
  - d) The project was therefore delayed an additional **25 calendar days in this time period** (130 days – 105 days = 25 days).
- 6.88 From my review of the contemporaneous documents and the progress achieved during this time, the principal cause(s) of critical delay in this window appear to have been as follows:
- a) Additional and increased duct banks as a result of PG&E's preferential electrical changes; and
  - b) A project shut down caused by a fuel truck hitting a 4" gas line.

<sup>230</sup> See Baseline Schedule Activity ID: A2820 "Termination"

<sup>231</sup> [JHK\_BURNEY\_00167348-JHK\_BURNEY\_00167354] See JH Kelly Daily Report of 16 December 2017

<sup>232</sup> See Baseline Schedule Activity ID: A2820 "Termination"

***Additional and Increased Duct Banks as a result of PG&E's Preferential Electrical Changes***

- 6.89 As previously discussed, the Construction Baseline Schedule was prepared based on the 90% design drawings. It is my understanding that these drawings contained 900 linear feet of conduit in 2 duct banks.<sup>233</sup> The Construction Baseline Schedule also stipulated that underground conduit excavations and installations would be carried out between 29 March and 4 May 2017 (over a period of 36 calendar days for the Auxiliary, Compressor, and Hazmat Storage buildings).<sup>234</sup>
- 6.90 As discussed by Mr. Lee in his deposition, on or around July 2017, the Construction Schedule was finally updated to reflect the preferential changes made by PG&E activities including the additional and increased duct banks.<sup>235</sup> According to this schedule, JH Kelly planned to complete the added scope and the remaining duct banks between 31 July 2017 and 30 November 2017 (over a period of 122 calendar days).<sup>236</sup> In other words, the July 2017 schedule showed an 86 day increase over the Construction Baseline Schedule.
- 6.91 Further compounding the impact of this added scope, JH Kelly continued to encounter boulders in several areas. In fact, according to JH Kelly's daily reports, immediately upon commencing the duct bank, they encountered rock and existing PG&E utilities that hindered their progress between 1 and 4 August 2017.<sup>237</sup>
- 6.92 By the end of August 2017, JH Kelly had completed 6 duct banks and in the weekly meetings it was reported that the underground electrical work was 40% complete (with 19,500 LF installed).<sup>238</sup>

[Case 4:20-cv-02387-H2C Document 550-3 Filed 04/15/21 Page 80 of 145](#)

<sup>233</sup> [JHK\_BURNEY\_00383758 (Graphic 2), JHK\_BURNEY\_00383791 (Ex. 6)] JH Kelly Revised Delay Claim

<sup>234</sup> See Baseline Schedule Activity ID: A1190, A2130, and A2510 "Install Underground Conduit" for the Compressor, Auxiliary and Hazardous Material Building. Note: These are the only underground conduit activities specified in the Construction Baseline Schedule and were planned to be completed between 29 March and 4 May 2017

<sup>235</sup> See Tom Lee deposition Draft pages 196 to 197

<sup>236</sup> [BURNEY000110672] See AECOM July 2017 Monthly Report, page 45/92

<sup>237</sup> [JHK\_BURNEY\_00337437-JHK\_BURNEY\_00337439 (8/1), JHK\_BURNEY\_00337089-JHK\_BURNEY\_00337090 (8/4)] See JH Kelly Daily reports of 1 and 4 August 2017

<sup>238</sup> [JHK\_BURNEY\_00151594-JHK\_BURNEY\_00151598] 2017-08-30-BURNEY K2 MEETING MINUTES



**Figure 6-27: Progress photo of duct banks as at 29 August 2017<sup>239</sup>**

6.93 In September 2017, JH Kelly continued to progress the duct bank work in Zone 1 as excerpted in AECOM's October monthly report below and shown in the following photo.<sup>240</sup>

Work continued on excavation for the underground piping for Fuel Gas, Utility and Instrument Air to the Auxiliary Building, DB7, DB52, and DB43 (gas cooler south side). This work was impeded by continued discovery of unmarked/mismarked existing utilities and hard rock and boulders in the excavations. This work is additional work and outside the scope set forth in the Contract. Excavation work was further slowed by PG&E's prohibition against using mechanical means in the area to complete DB7 and DB 52. As a result, rock removal was performed by hand, which substantially extended the duration of this work and likewise increased costs. The Fire Water Tank foundation was completed at the end of October and ready for the tank installation contractor to install the tank materials that are on site next month.

Planned excavation/demolition of the Zone 1 piping was delayed due to PG&E delays to clearing the lines, primarily caused by the failure of GOV-2 to completely seal. Once the valve was sealed, the final cap was welded on October 13. Thereafter, JH Kelly was able to begin demolition of the underground pipe and ductbank in Zone 1 in preparation of installing the new 30" pipe spools only after completion of the cross compression performed by PG&E in association with the replacement of V-35.

**Figure 6-28: AECOM Monthly Report of September 2017<sup>241</sup>**

<sup>239</sup> [JHK\_BURNEY\_00337899-JHK\_BURNEY\_00337906] AECOM Daily report of 29 August 2017

<sup>240</sup> [BURNEY000088005-BURNEY000088106] See AECOM Monthly Report for September 2017

<sup>241</sup> [BURNEY000088005-BURNEY000088106] See AECOM Monthly Report for September 2017

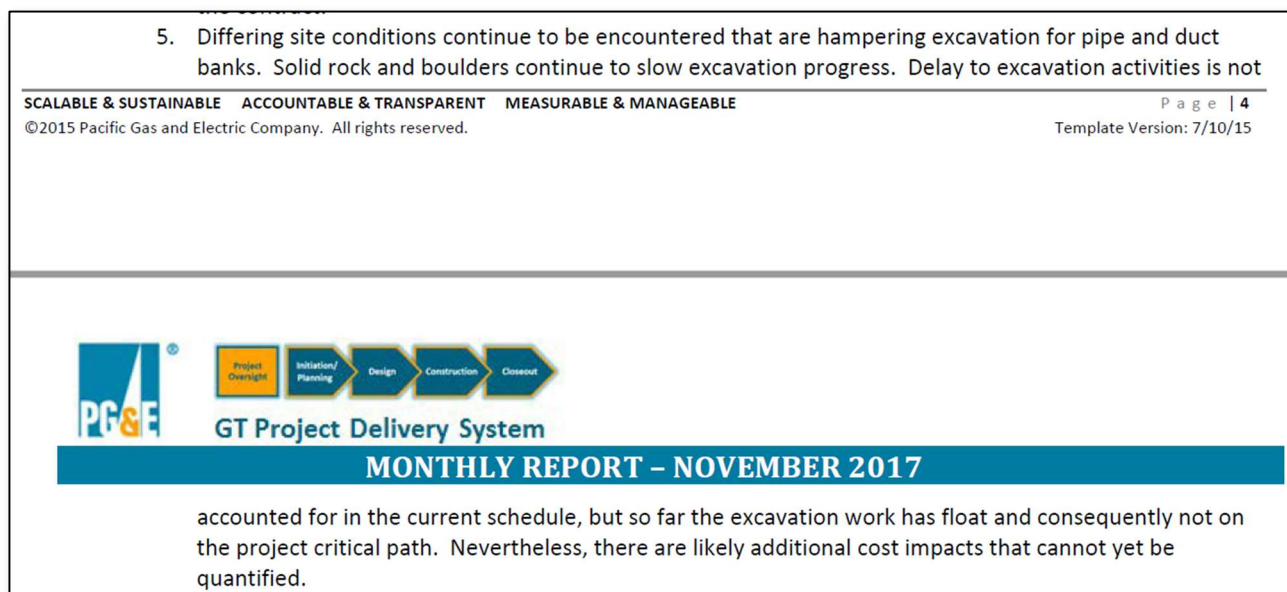


**Figure 6-29: Installed Duct Bank as at September 2017<sup>242</sup>**

6.94 Both AECOM and JH Kelly contemporaneously noted that excavations for duct banks were hindering their daily work for much of the month of November and early December 2017 as set out below.

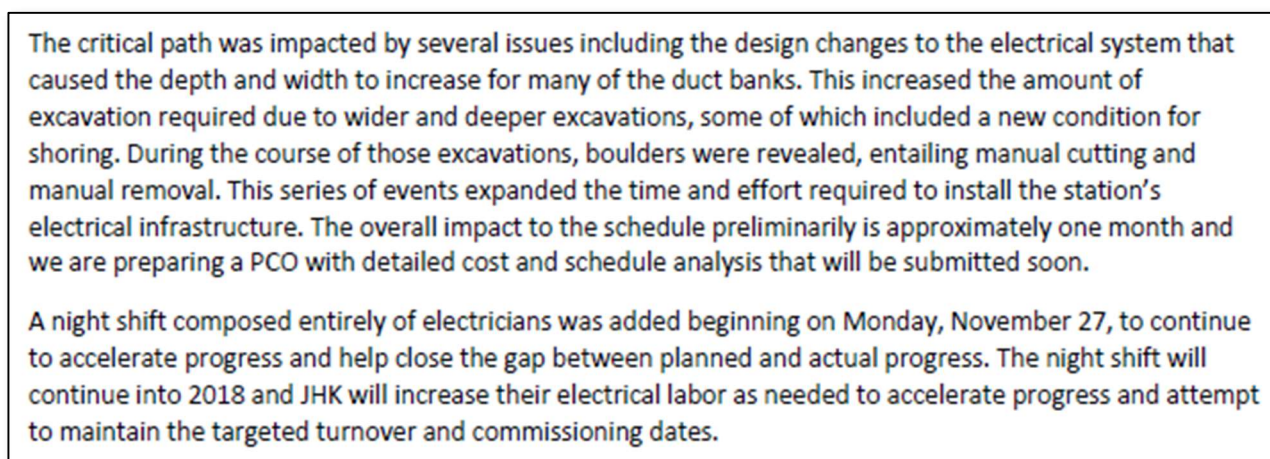
6.95 According to AECOM's November monthly report, as of 11/15/17, excavations for duct banks were hindering their daily work for much of the month of November and early December 2017 as set out below.

<sup>242</sup> [BURNEY000088005-BURNEY000088106] See AECOM Monthly Report for September 2017



**Figure 6-30: Excerpt of AECOM's November Monthly Report<sup>243</sup>**

6.96 By the December monthly report, AECOM reported:



**Figure 6-31: Excerpt of AECOM's December Monthly Report<sup>244</sup>**

6.97 It can also be seen in the above, that JH Kelly increased their manpower and added a second shift in an attempt to mitigate some of the incurred delay.

<sup>243</sup> [BURNEY000111119-BURNEY000111235] See AECOM Monthly Report for November 2017

<sup>244</sup> [BURNEY000246215-BURNEY000246343] See AECOM Monthly Report for December 2017

6.98 JH Kelly completed duct banks 27, 51, and 52 by 15 December 2017.<sup>245</sup> The completion of these duct banks allowed JH Kelly to commence terminations and testing in the Auxiliary Building on 16 December 2017.<sup>246</sup>



**Figure 6-32: Progress photo for duct bank installation as at 8 December 2017<sup>247</sup>**

#### ***4" Gas Line Damage***

6.99 It is noted that portions of the duct bank work on the Project were halted after a JH Kelly subcontractor fuel truck struck a 4" gas line on 14 October 2017.<sup>248 249</sup> AECOM reported this damage in its October 2017 monthly report as shown in the figure below.<sup>250</sup>

<sup>245</sup> See As-Built Activity ID: ELEC00500 and ELEC00920 "Install UG Conduit DB-27 & DB-51" and "Install UG Conduit DB-52"

<sup>246</sup> [JHK\_BURNEY\_00167348-JHK\_BURNEY\_00167354] See JH Kelly Daily Report of 16 December 2017

<sup>247</sup> [BURNEY000246215-BURNEY000246343] See AECOM Monthly Report December 2017

<sup>248</sup> See as-built schedule activity ID PIPE01560 "4-inch gas line damaged by collision with fuel truck"

<sup>249</sup> See Exhibit 208 attached to Draft Lee deposition (which is the actual incident report of 14 October 2017)

<sup>250</sup> [BURNEY000087398] AECOM October 2017 Monthly Report Page 41



**Figure 6-33: Damaged 4" Gas Line from AECOM October 2017 Monthly Report<sup>251</sup>**

6.100 A blowdown and cross compression of the piping was required before construction could resume on 20 October 2017.<sup>252</sup>

6.101 As reported by JH Kelly in its daily report of hindrances ***"all work on east fence line has been put on hold by PGE for checking out damaged gas line and cross compression testing"***.<sup>253</sup>

6.102 As also reported in AECOM's schedule delay log:

***All work on the east and north east side of the station stopped due to the fuel truck hitting the 4" gas line. PG&E had to blowdown the line and replace the damaged valve. This effected the Demo work on the Main Gas line at Tie-in 22 and 37 locations and DB 7 excavation activities. The gas line valve was replaced by 10-16-17 and line was saved out. PG&E would not let AECOM continue any construction***

<sup>251</sup> [BURNEY000087398] AECOM October 2017 Monthly Report Page 41

<sup>252</sup> See as-built schedule activity ID PIPE01590 "Cross-Compression in Zone 1 before resuming Construction"

<sup>253</sup> [JHK\_BURNEY\_00338468] JH Kelly daily report for 16 October 2017 page 5

***activities on the east and North east side of the station until cross compression was completed on 10-20-17***<sup>254</sup>

6.103 As the duct banks were on the actual critical path during this time period, I have attributed the 6 days of non-work time between 14 and 20 October as a JH Kelly delay as it was a JH Kelly subcontractor that damaged the valve and caused a shutdown of the majority of the Project.

***Conclusion***

6.104 As discussed above, JH Kelly did not commence the terminations in the Auxiliary Building until 16 December 2017. Given that JH Kelly planned to commence terminations in the Auxiliary building by 8 August 2017, this means that the Project was 130 calendar days in delay at this point in time (16 December 2017 – 8 August 2017 = 130 days). Considering the delay incurred in the previous time periods (i.e. 109 days), the Project lost an additional 25 days in this time period.

6.105 In my opinion, while the majority of this delay can be attributed to the added scope caused by PG&E's change in design criteria. 6 days of the delay was caused by the shutdown caused by the damaged gas line.

6.106 I note that this delay would likely have been greater had AECOM and JH Kelly not accelerated the work by increasing their manpower.

6.107 The table below summarizes the actual delay incurred in Phase 2 Window III. The delay during this time period is also illustrated in Figure 6-34 on the following page.

| Phase 2 Window | Cause of Delay   | Delay in Window (Days) |
|----------------|--|------------------------|
|                | Delays through Window II   | 105                    |
| III            | Additional and increased duct banks as a result of PG&E's preferential electrical changes (PG&E) | 19                     |
| III            | 4" Gas Line Damage (JH Kelly)  | 6                      |
|                | <b>Total</b>   | <b>130</b>             |

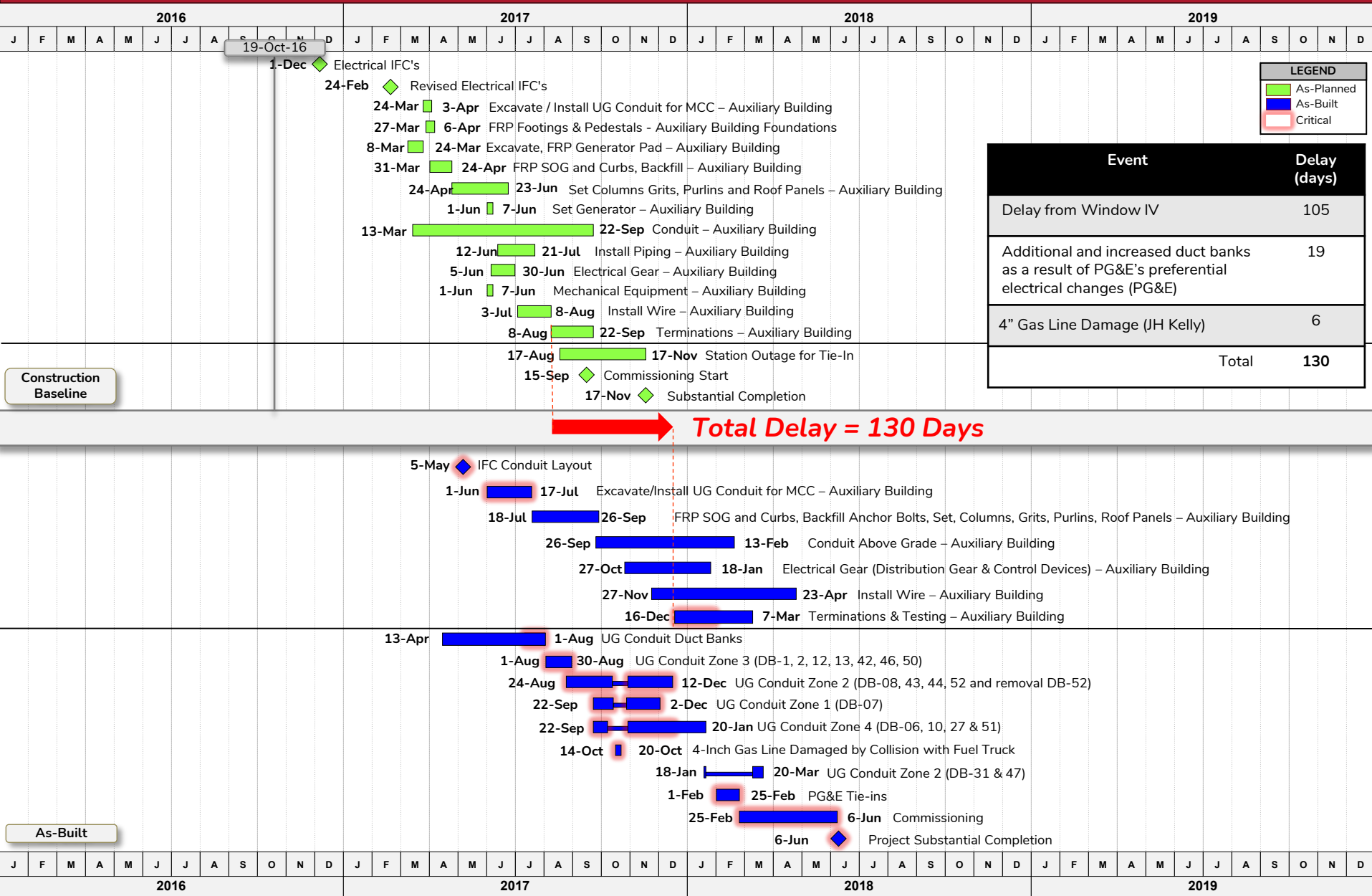
Case 4:20-cv-02387-H2C Document 550-3 Filed 04/15/21 Page 86 of 145

<sup>254</sup> [AEC00610570] AECOM Schedule Delay Log

# Burney Compressor Station K-2 Replacement Project

## Phase II Window III – Installation of Underground Duct Banks

Figure 6-34



**Phase 2 Window IV – Terminations and Testing (16 Dec 2017 to 2 Feb 2018)*****Introduction***

- 6.108 After substantially completing the underground conduit in the duct banks, JH Kelly commenced the terminations and testing within the Auxiliary Building on 16 December 2017. Shortly thereafter, due to the upcoming holidays, the parties agreed to shut down the Project for a period of 12 days.
- 6.109 Upon returning, JH Kelly continued the termination and testing works in the Auxiliary Building. Although JH Kelly added shifts for this electrical work, they had inefficiencies pulling wire through the conduit and performing terminations. As a result, JH Kelly was only 30% complete with this work when the critical path shifted into Commissioning (i.e., Phase 3 on 2 February 2018).
- 6.110 In terms of critical delay in this time window:
- a) At the beginning of this time window (i.e., on 16 December 2017), the Project was 130 calendar days behind schedule;
  - b) According to the Construction Baseline Schedule, PG&E's tie ins were scheduled to commence on 5 September 2017;
  - c) In fact, PG&E did not actually commence its tie-ins until 1 February 2018 – 150 calendar days later than planned (1 February 2018 – 5 September 2017 = 150 days); and
  - d) The Project therefore was delayed **20 calendar days in this time period** (150 days – 130 days = 20 days).
- 6.111 From my review of the contemporaneous documents and the progress achieved during this time, the principal cause(s) of critical delay in this window appear to have been as follows:
- a) Agreed Project Shut Down; and
  - b) Inefficiencies pulling wire and performing terminations.

***Agreed Project Shut Down***

- 6.112 It is my understanding that the parties agreed to shut down the Project for a period of 12 calendar days between 22 December 2017 and 2 January 2018.<sup>255</sup> It is also my understanding that this delay was agreed to be excusable from Liquidated Damages but non-compensable for extended general conditions.<sup>256</sup>

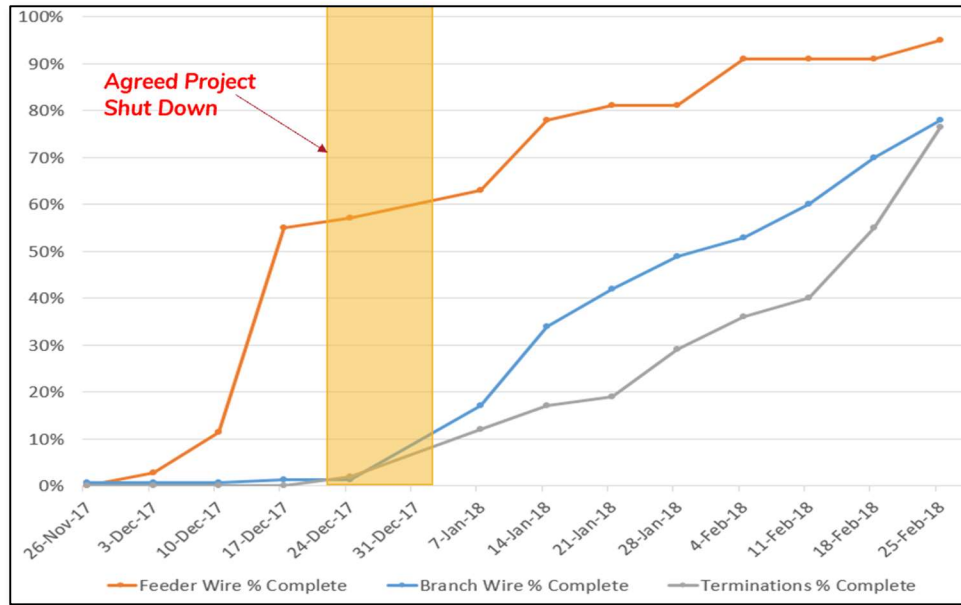
---

<sup>255</sup> [BURNEY000246215-BURNEY000246343] (report), AECOM monthly report Dec 2017

<sup>256</sup> [BURNEY000246215-BURNEY000246343 (report), BURNEY000246243 (pg. w/excerpt in report)] AECOM monthly report Dec 2017; IFC Conduit Layout on 27 March 2017

***Pulling Wire and Performing Terminations.***

6.113 As can be seen in the figure below, JH Kelly commenced terminations at the beginning of this window, but did not make substantial progress until after the Agreed Project Shut Down over the winter holidays.



**Figure 6-35: Progress for Wire and Terminations<sup>257</sup>**

6.114 After recommending this work, it took longer than planned for JH Kelly to pull wire such that JH Kelly was only 30% complete with this work when the critical path shifted into Commissioning. While it is possible that some of this additional time was due to PG&E's preferential changes (i.e., added duct bank and conduit), I do not have the records available to me to determine how much, if any, time should be allocated to PG&E. Therefore, for purposes of this report, I have assumed all of the delay is due to JH Kelly as this was part of their scope to complete in a timely manner.

***Conclusion***

6.115 Of the 20 calendar days that were lost during this time period, 12 calendar days can be attributed to the agreed Project shut down. In my opinion, the remaining 8 days of delay can be attributed slower than planned progress pulling wire and completing the terminations.

6.116 The table below summarizes the actual delay incurred in Phase 2 Window IV. The delay during this time period is also illustrated in Figure 6-36 on the following page.

<sup>257</sup> [BURNEY000371663] Progress as reported in AECOM's February 2018 monthly report quantities, Page 47/138

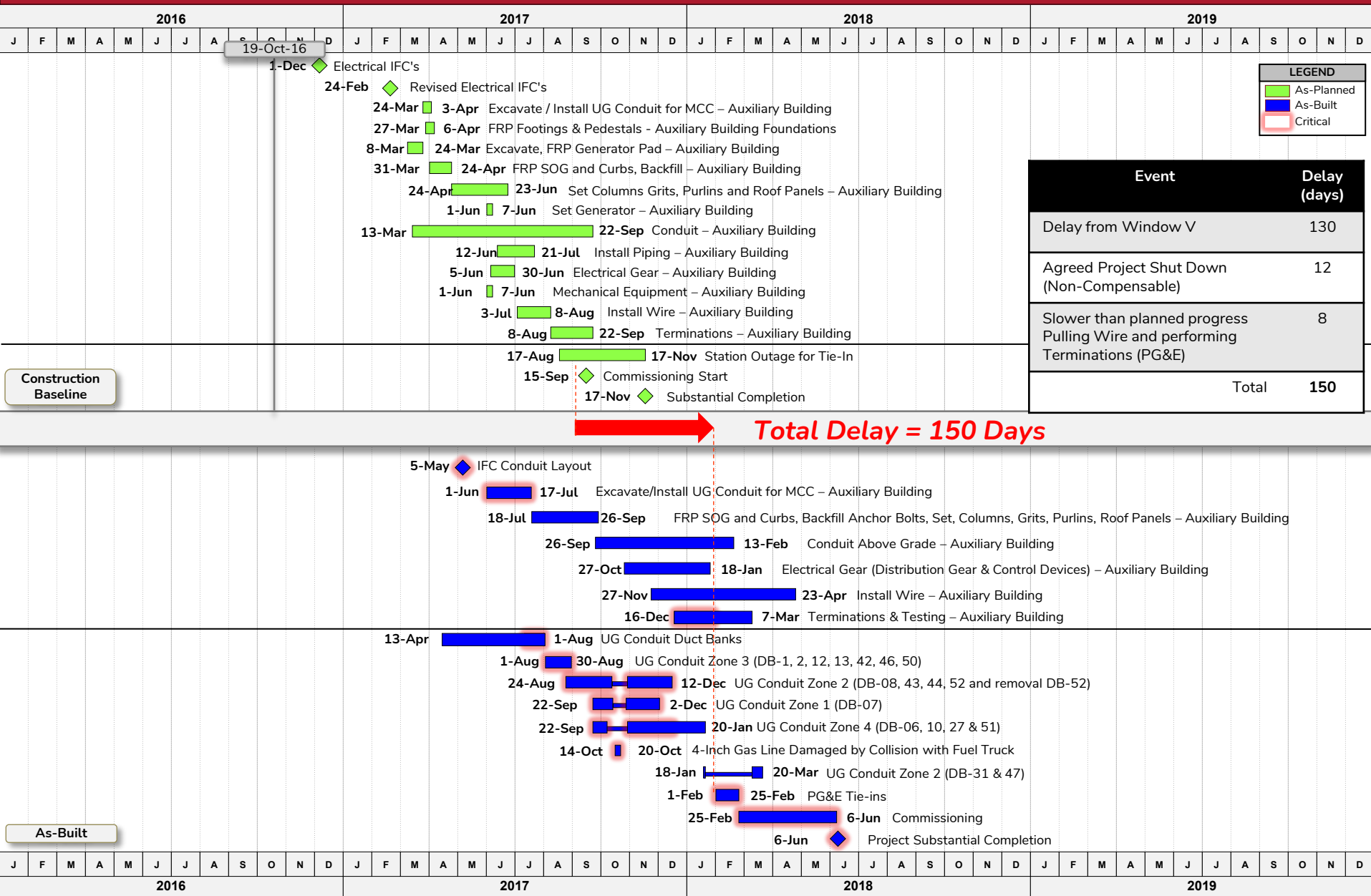
| Phase 2 Window | Cause of Delay   | Delay in Window (Days) |
|----------------|--|------------------------|
|                | Delays through Window III  | 130                    |
| IV             | Agreed Project Shut Down (Not Compensable)                                       | 12                     |
| IV             | Slower than planned progress Pulling Wire and Performing Terminations (JH Kelly) | 8                      |
| <b>Total</b>   |  | <b>150</b>             |

# Burney Compressor Station K-2 Replacement Project

## Phase II Window IV – Termination and Testing

Case 4:20-cv-05381-HSG Document 220-3 Filed 04/21/22 Page 101 of 142

Figure 6-36



### Conclusion of Analysis of Delay to Construction

6.117 As discussed above, at the end of the Construction period (i.e., 2 February 2018), the Project was 150 calendar days behind schedule. This attribution of this delay can be seen in the table below.

| Window       | Delay Description  | PG&E      | JHK       | AECOM    | Exc. Non-Comp | Cumulative Delay |
|--------------|--|-----------|-----------|----------|---------------|------------------|
| I            | PG&E's Preferential Changes to the Electrical Design and the conflict between the duct bank and the existing utility | 32        | 32        | 0        | 0             | 64               |
| II           | Boulder Excavation   | 7         | 0         | 0        | 0             | 71               |
| II           | Additional Scope   | 19        | 0         | 0        | 0             | 90               |
| II           | Lack of Resources  | 0         | 15        | 0        | 0             | 105              |
| III          | Added Scope Duct Banks   | 19        | 0         | 0        | 0             | 124              |
| III          | 4" Gas Line Damage   | 0         | 6         | 0        | 0             | 130              |
| IV           | Agreed Project Shut Down   | 0         | 0         | 0        | 12            | 142              |
| IV           | Slower than planned progress Pulling Wire and Performing Terminations  | 0         | 8         | 0        | 0             | 150              |
| <b>Total</b> |  | <b>77</b> | <b>61</b> | <b>0</b> | <b>12</b>     | <b>150</b>       |

## 7 Analysis of Delay to Commissioning

- 7.1 As discussed previously, I have divided my analysis of delay into three time periods. This section deals with the third time period which is for the Commissioning Phase of the Project and covers the period between 2 February 2018 and 6 June 2018.

### The Planned Sequence of Commissioning

- 7.2 As is typical on oil and gas projects, as the Project neared Mechanical Completion, AECOM began to develop a Commissioning Schedule. As can be seen from the excerpt below, the schedule was formally submitted to PG&E in early February 2018 and is herein referred to as the “Commissioning Schedule”.

The critical path ran through the Auxiliary Building where extensive electrical work was ongoing. The planned schedule for remaining work is being carefully evaluated to account for actual progress and will incorporate a detailed commissioning schedule. This revised schedule was formally submitted early February 2018. Issues affecting the critical path this month include but are not limited to ongoing changes to the electrical design and impacts due to winter weather, extended overtime schedules and increased absenteeism, yet the current substantial completion date is being maintained until an analysis of the schedule is completed early February.

JH Kelly is on track to be mechanically complete in late February to allow commissioning activities to commence for multiple systems. It is anticipated the critical path will shift from construction installation to commissioning activities in February. After Substantial Completion and Station Startup, the critical path runs through the final civil work and paving, then demobilization and final completion documentation.

**Figure 7-1 – Excerpt from AECOM’s January 2018 Monthly Report<sup>258</sup>**

- 7.3 It is my understanding that PG&E did not comment on this schedule and therefore it is deemed to have been approved.
- 7.4 According to the Commissioning Schedule, AECOM planned to achieve Substantial Completion of the Project by 16 April 2018 – **150 days later than planned.**<sup>259</sup> This matches the delay discussed at the end of Phase 2.
- 7.5 Also according to the Commissioning Schedule, there were two distinct paths of work to achieve Substantial Completion: one path was through the commissioning of the power systems; while the

<sup>258</sup> [BURNEY000298833-BURNEY000298983] AECOM January 2018 Monthly Report

<sup>259</sup> [BURNEY000298833-BURNEY000298983] See Commissioning Schedule

other path was through the tie-in to existing utilities so that gas could be brought into the station for initial compressor commissioning runs.

7.6 The path through the commissioning of the power system ran through the following activities:

- a) Completion of Terminations and Testing in the Auxiliary Building;
- b) Electrical Systems Turnover Packages;
- c) Commencement of UPS Commissioning;
- d) Control Systems Commissioning;
- e) K-1 Commissioning Runs and Tests (Compressor Performance Test); and
- f) Turnover to PG&E.

7.7 The path through bringing gas into the station ran through the following activities:

- a) PG&E Main Gas tie-ins;
- b) Soap and pressure Test;
- c) Punchlist and Turnover for Main Gas;
- d) Mechanical Systems Turnover Packages;
- e) Station Main Gas and Blowdown Commissioning;
- f) Initial Compressor Commissioning Runs;
- g) K-1 Commissioning Runs and Tests (Compressor Performance Test); and
- h) Turnover to PG&E.

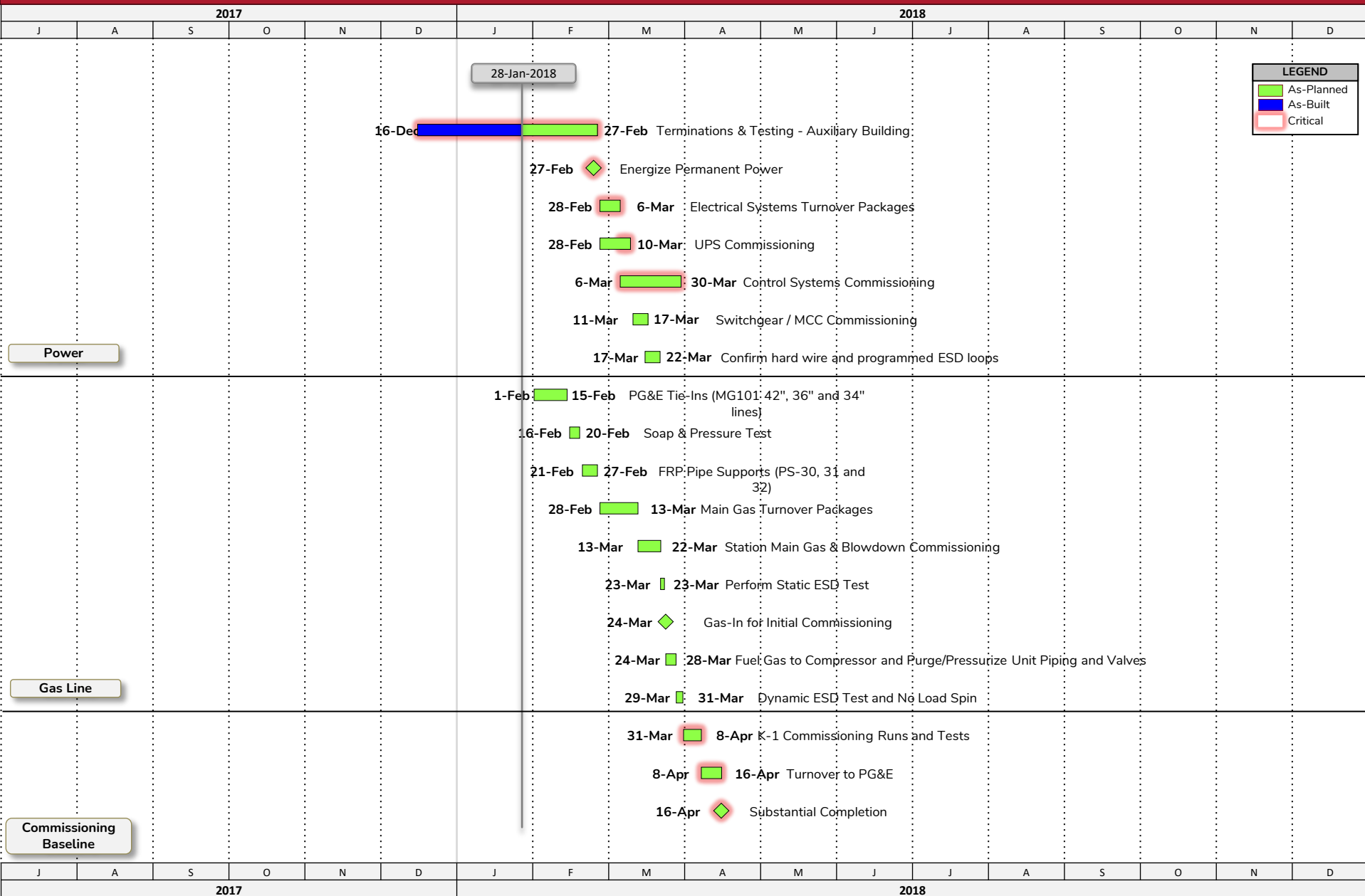
7.8 Both of the above paths can be seen in Figure 7-2 on the following page.

# Burney Compressor Station K-2 Replacement Project

## Commissioning Schedule

Case 4:20-cv-05381-HSG Document 220-3 Filed 04/21/22 Page 105 of 142

Figure 7-2



### The Actual Sequence of Commissioning

- 7.9 While JH Kelly was progressing the electrical works within the Auxiliary Building with added shifts and overtime, AECOM could not progress the main gas testing and commissioning until PG&E completed its tie-ins. These tie-ins connected the new Project piping into the existing utilities. According to the Commissioning Schedule, PG&E planned to commence these tie-ins on 1 February 2018 and complete them by 15 February 2018.
- 7.10 PG&E actually commenced its tie-ins (specifically the Main Gas – 101 42” line in Zone 1) as planned on 1 February 2018.<sup>260</sup> However, due to a number of revisions to the Burney Tap tie-in spool (which concerns Change Order Request 262)<sup>261</sup>, PG&E did not complete its tie-ins until 25 February 2018<sup>262</sup> – **10 days later than planned** (25 February 2018 – 15 February 2018 = 10 days).
- 7.11 While the tie-ins were being delayed, the electrical work progressed as planned. In fact, permanent power was achieved on 27 February 2018 as shown in the Commissioning Schedule.<sup>263</sup>
- 7.12 As a matter of principle, if there are two critical paths and one is able to progress (e.g., the power commissioning) and the other is not (e.g., the gas commissioning), then the work that is progressing almost immediately falls off the critical path and the path that is not progressing becomes the sole critical path. It is therefore my opinion that almost immediately upon the issuance of the commissioning schedule, as JH Kelly was progressing the electrical work, the critical path ran solely through bringing gas into the Project.
- 7.13 Once the main gas tie-ins were completed, AECOM performed the Soap test to ensure that there were no gas leaks through the new connection.<sup>264</sup>
- 7.14 Upon completing the Soap test, AECOM completed the main gas turnover packages which were required to begin the static Emergency Shut Down (ESD) test. The ESD system is designed to safely discharge gas in the event of an emergency.

Case 4:20-cv-02387-HSC Document 550-3 Filed 04/15/21 Page 106 of 145

<sup>260</sup> See As-Built Schedule Activity ID PIPE00570 “Install W-MG101-42-FLD-01 Tie-Ins 01, 02 & MG-101-42-A & B by PG&E - Zone 1”

<sup>261</sup> See As-Built Schedule Activity ID COR00262D “Tie-In & NDE Burney Tap Spools Rev. 3 - by PG&E”

<sup>262</sup> [JHK\_BURNEY\_00171240-JHK\_BURNEY\_00171241 (Feb 19), JHK\_BURNEY\_00169251-JHK\_BURNEY\_00169252 (Feb 25)] JH Kelly Daily Report of 19 and 25 February 2018

<sup>263</sup> See As-Built Schedule Activity ID BCS.800 “Permanent Power In to the Station”

<sup>264</sup> See As-Built Schedule Activity ID BCS.910 “Soap and Pressure Test after Tie-In”

- 7.15 The Static ESD test started on 7 April and was planned to take 1 day. However, due to problems with the new fire suppression program, the test was not completed until 12 April 2018 – **20 days later than planned in the Commissioning Schedule**.<sup>265</sup>
- 7.16 Once the static ESD test was completed, AECOM planned to bring gas into the station for initial commissioning runs. However, on 13 April 2018, the ESD system recorded a fault signal from the Programmable Logic Controller (“PLC”) network which resulted in gas being discharged.<sup>266</sup> After troubleshooting the system, a “mask” was put in place as a temporary fix to allow gas commissioning to proceed.<sup>267</sup>
- 7.17 On 18 April 2018, with the “mask” mitigation measure in place, gas was brought in for the initial commissioning runs (**25 days later than planned in the Commissioning Schedule**).<sup>268</sup>
- 7.18 With gas in the system, AECOM planned to perform the initial commissioning runs. However, due to a number of issues (including a problem with the generator wire harness and a damaged “witches’ hat” strainer) the 100-hour performance test was not performed until 13 May 2018 – **43 days later than planned in the Commissioning Schedule**.<sup>269</sup>
- 7.19 After commencing, the 100-hour performance test was interrupted on 15 May 2018 due to a power outage.<sup>270</sup> As will be discussed, it was not until 22 May 2018, that AECOM could resume the 100 hour and 10-day performance tests.<sup>271</sup>
- 7.20 Once testing was resumed, AECOM was able to complete the performance tests of the Compressor unit and achieve Substantial Completion on 6 June 2018 (**51 days later than planned in the Commissioning Schedule**).<sup>272</sup>
- 7.21 This as-built critical path is illustrated in Figure 7-3 on the following page.

<sup>265</sup> See As-Built Schedule Activity ID COMM-70 “Perform Static ESD test”  
<sup>266</sup> [AEC00785332-AEC00785335 (entire doc), AEC00785331(B), AEC00785333 (IV)] See AECOM Commissioning Plan of the Day for 14-Apr-18 section B and IV

<sup>267</sup> [BURNEY000377900] See AECOM April 2018 monthly report page 23

<sup>268</sup> [AEC00459957-AEC00459960 and AEC00390312-AEC00390315, AEC00459957 (4/18 sect I), AEC00390312 (4/19 sect. I)] See AECOM Commissioning Plan of the Day for 18 and 19-Apr-18 section I

<sup>269</sup> [AEC00394617-AEC00394620 (entire doc), AEC00394618 (K)] See AECOM Commissioning Plan of the Day for 14-May-18 section K

<sup>270</sup> [AEC00329747-AEC00329750, AEC00329748 (K)] See AECOM Commissioning Plan of the Day for 16-May-18 section K

<sup>271</sup> [AEC00373571-AEC00373573, AEC00373572 (sect VII)] See AECOM Commissioning Plan of the Day for 22-May-18 section VII

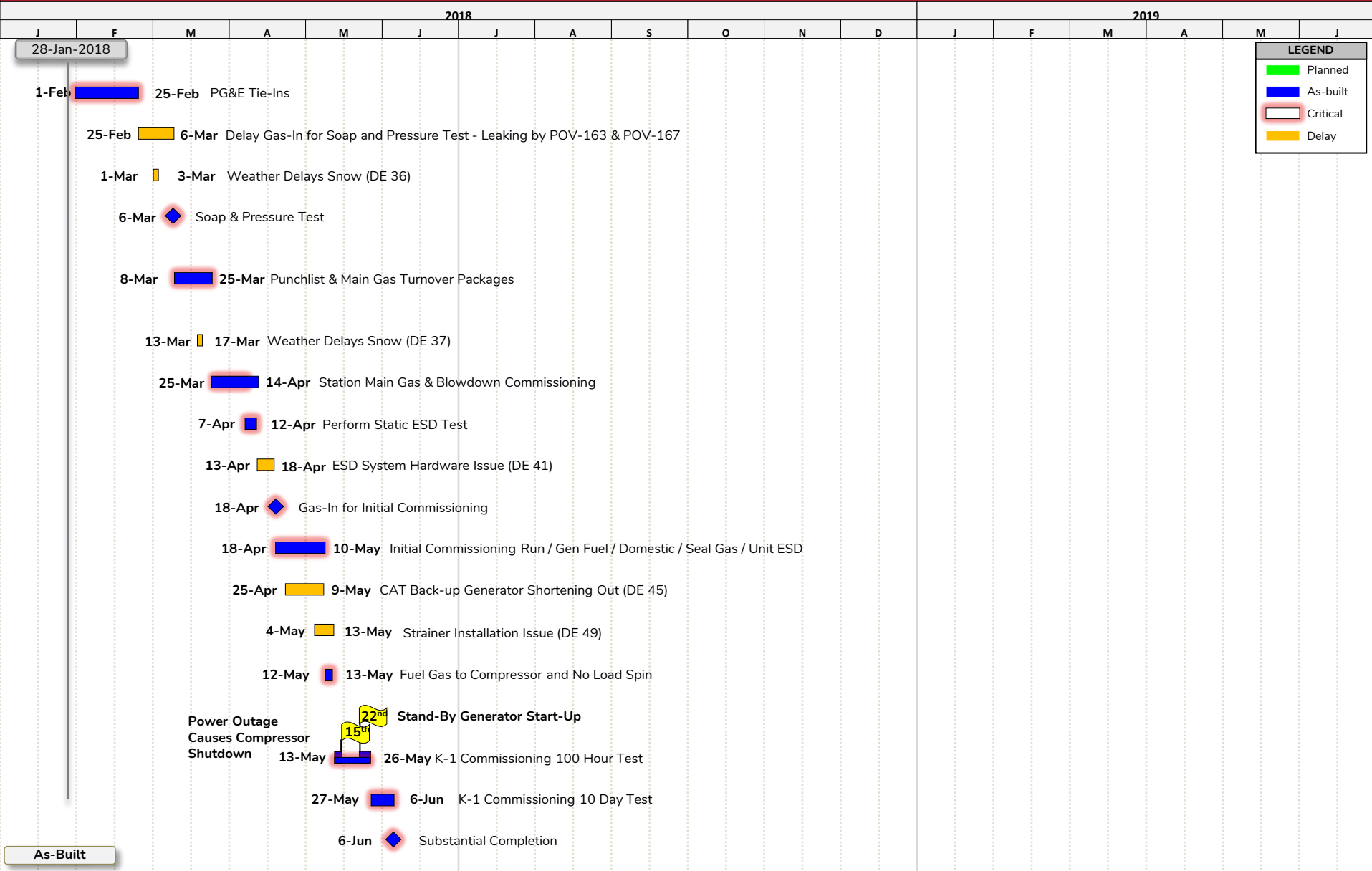
<sup>272</sup> [AEC00224561-AEC00224564] See AECOM Letter to PG&E dated 13-Jun-18

# Burney Compressor Station K-2 Replacement Project

## Actual Sequence of Commissioning

Case 4:20-cv-05381-HSG Document 220-3 Filed 04/21/22 Page 108 of 142

Figure 7-3



### Periods of Performance

7.22 To assist in the discussion and analysis of delays, I have broken the total period of performance into 8-time windows as can be seen in the table below. These time windows were established based on revisions to the planned sequence of commissioning, key events and shifts in the critical path.

| Window | Description                           | Time Frame                 |
|--------|---------------------------------------|----------------------------|
| I      | PG&E Tie-Ins                          | 2 Feb 2018 to 25 Feb 2018  |
| II     | Soap Test                             | 25 Feb 2018 to 6 Mar 2018  |
| III    | Turnover of Main Gas                  | 6 Mar 2018 to 7 Apr 2018   |
| IV     | Completion of Static ESD Test         | 7 Apr 2018 to 12 Apr 2018  |
| V      | Gas-In for Initial Commissioning Runs | 12 Apr 2018 to 18 Apr 2018 |
| VI     | Initial Commissioning Runs            | 18 Apr 2018 to 13 May 2018 |
| VII    | Completion of 100-hour Test           | 13 May 2018 to 26 May 2018 |
| VIII   | Substantial Completion                | 26 May 2018 to 6 Jun 2018  |

7.23 I discuss the above time periods in detail below and for each one I consider:

- a) The start and finish date of that window and the critical delay at the start and finish date of each window;
- b) The critical path during each window;
- c) The performance of the works during each period; and
- d) The primary cause(s) of delay during each window.

### **Phase 3 Window I – PG&E Tie-Ins (2 Feb 2018 to 25 Feb 2018)**

#### ***Introduction***

- 7.24 As discussed previously, it is my opinion that immediately after the issuance of AECOM’s Commissioning schedule, the critical path ran solely through the activities necessary to bring gas into the plant and specifically through PG&E’s tie-ins to the main gas line.
- 7.25 In terms of critical delay in this time window:
- a) The beginning of this time window, (i.e., on 2 February 2018), is the date of the Commissioning Schedule;
  - b) According to the Commissioning Schedule, AECOM planned to have PG&E complete its tie-ins by 15 February 2018 to allow for the Soap Test of the main gas line;<sup>273</sup>
  - c) As it turns out, PG&E did not complete the tie-ins until 25 February 2018 – **10 calendar days later than planned** (25 February 2018 – 15 February 2018 = 10 days);<sup>274</sup> and
  - d) The Project therefore was delayed **10 calendar days in this time period**.
- 7.26 From my review of the contemporaneous documents and the progress achieved during this time, the principal cause(s) of critical delay in this window appear to have been as follows:
- a) Late completion of PG&E tie-ins

#### ***Late Completion of PG&E tie-ins***

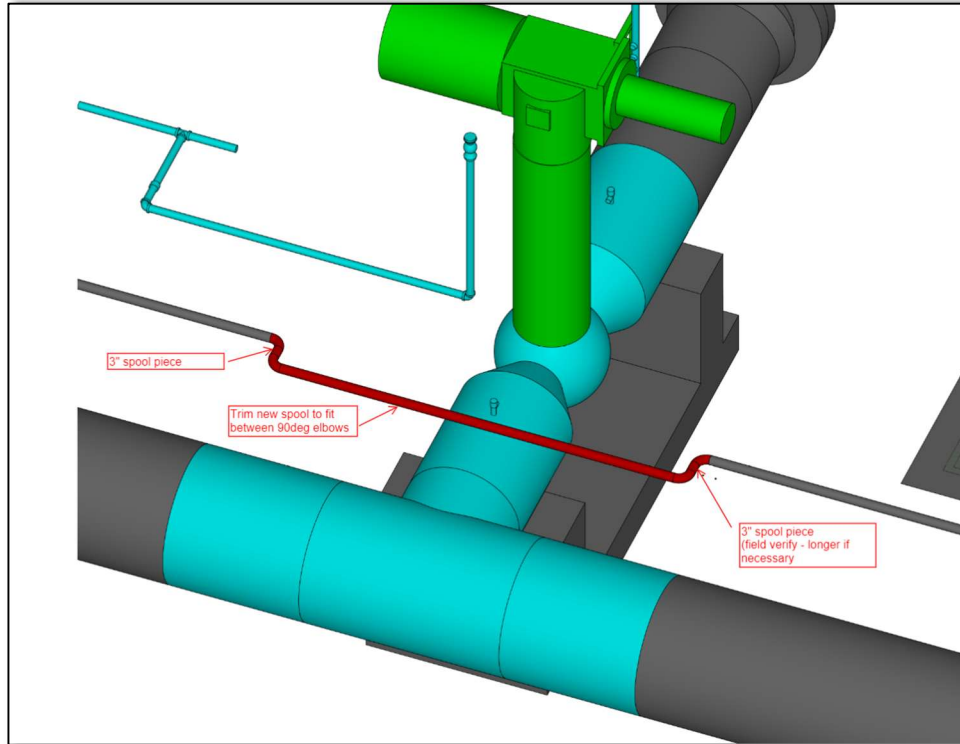
- 7.27 At the Burney Compressor Station, there are two parallel pipelines (L-400 and L-401) which deliver gas into the station. To begin commissioning for the main gas system, various “tie-ins” needed to be made to connect the new compressor into the existing network. The tie-in spool is a short segment of pipe which joins the new pipe to existing main gas pipe.
- 7.28 According to the Commissioning Schedule, PG&E was required to perform several tie-ins which would allow for AECOM to perform the soap and Pressure test. Specifically, these tie-ins were located at the terminus where gas is delivered into the new compressor unit system.<sup>275</sup>
- 7.29 On or around 19 February 2018, it was discovered that the Burney tap tie-in spool needed to be re-routed to avoid conflicting with the existing main gas pipe (which apparently was in a different

<sup>273</sup> See Commissioning Schedule Activity ID:

<sup>274</sup> [JHK\_BURNEY\_00169251-JHK\_BURNEY\_00169252] JH Kelly daily report of 25 February 2018

<sup>275</sup> See As-Built Schedule Activity ID BCS.590, BCS.900

location than originally thought).<sup>276</sup> As a result, the original pipe fabricated by JH Kelly needed to be cut and field coated by Bernhard.<sup>277</sup> This re-routing is shown in red in the figure below and the costs were captured in JH Kelly's COR 262.<sup>278</sup>



**Figure 7-4 - Burney tap tie-in spool from RFI-222<sup>279</sup>**

- 7.30 Due to the COR 262 revisions, the fabrication and hydrotesting for the Burney Tap tie-in spool were not completed until at least 23 February 2018.<sup>280</sup>
- 7.31 JH Kelly was assisting PG&E with its tie ins until 25 February 2018.<sup>281</sup> However, PG&E supplied its own contractor for the welding associated with these tie-ins and is my understanding that the delay is not the responsibility of JH Kelly or AECOM.<sup>282</sup>
- 7.32 I also note that the Burney Tap tie-in spool modifications were included in AECOM's Change Order 7  
Case 3:20-cv-02381-HSC Document 550-3 Filed 04/15/25 Page 111 of 145  
to PG&E.

<sup>276</sup> See As-Built Schedule Activity ID "COR00262A" Fabrication - COR 262 - Burney Tap Tie-In Spool Rev. 3

<sup>277</sup> [AEC00915219-AEC00915230] RFI0222\_PCO0148\_BURNEY TAP FINAL CHANGES\_R1.pdf

<sup>278</sup> [AEC00221044-AEC00221045] COR 262 BURNEY TAP FINAL CHANGES.pdf

<sup>279</sup> [AEC00221048] See COR 262 attachment and email AECOM 2-19-18 Email Revise Sketch (1).pdf

<sup>280</sup> See As-Built Schedule activity ID COR00262D

<sup>281</sup> [JHK\_BURNEY\_00169251-JHK\_BURNEY\_00169252] JH Kelly daily report of 25 February 2018

<sup>282</sup> [BURNEY000371642] AECOM monthly report of February 2018 page 23

**Conclusion**

- 7.33 As discussed above, PG&E did not complete the tie-ins until 25 February 2018. Given that these tie-ins were to be completed by 15 February 2018 to allow for the Soap test, the Project was delayed an additional 10 days in this window (25 February 2018 – 15 February 2018 = 10 days).
- 7.34 As it is my understanding that the reason the tie-in spool needed to be rerouted was due to the existing main gas pipe being in the wrong location, I have attributed this delay to PG&E.
- 7.35 The table below summarizes the actual delay incurred in Phase 3 Window I. The delay during this time period is also illustrated in Figure 7-5 on the following page.

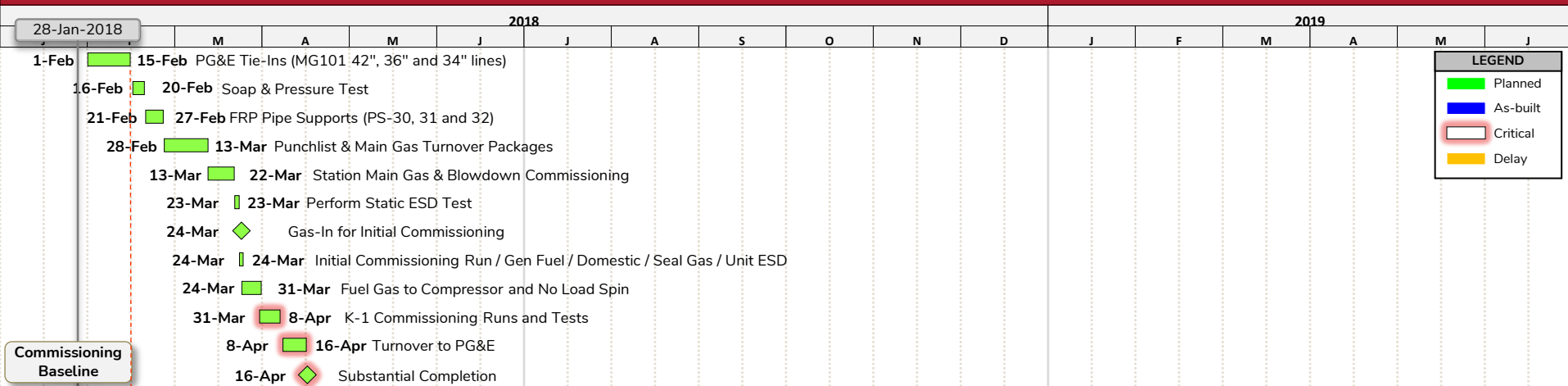
| Phase 3 Window | Cause of Delay                         | Delay in Window (Days) |
|----------------|--|------------------------|
| I              | Late Completion of PG&E tie-ins (PG&E) | 10                     |
| Total          |  | 10                     |

# Burney Compressor Station K-2 Replacement Project

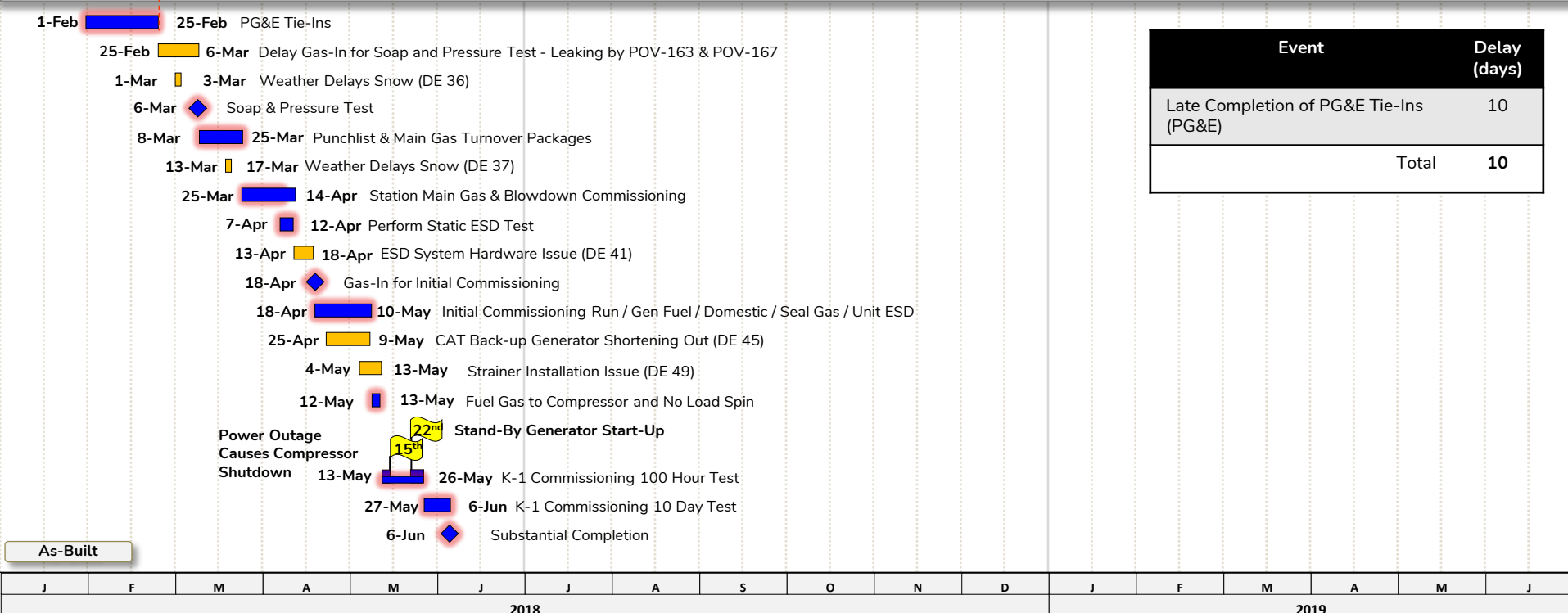
## Phase III Window I – PG&E Tie-Ins

Case 4:20-cv-05381-HSG Document 220-3 Filed 04/21/22 Page 113 of 142

Figure 7-5



**Total Delay = 10 Days**



| Event                                  | Delay (days) |
|--|--------------|
| Late Completion of PG&E Tie-Ins (PG&E) | 10           |
| Total                                  | 10           |

### Phase 3 Window II – Soap Test (25 Feb 2018 to 6 Mar 2018)

#### *Introduction*

- 7.36 AECOM planned to perform the Soap test immediately after PG&E completed its tie-ins. However, AECOM was unable to complete the Soap test as planned in the Commissioning Schedule due to leaks at valves POV-163 and POV-167 and weather delays.
- 7.37 In terms of critical delay in this time window:
- a) At the beginning of this time window (i.e., on 25 February 2018), the Project was 10 calendar days behind the Commissioning schedule (for a total delay of 160 calendar days);
  - b) According to the Commissioning Schedule, AECOM planned to complete the Soap test by 20 February 2018;<sup>283</sup>
  - c) As it turns out, AECOM was not able to complete the Soap test until 6 March 2018 – **14 calendar days later than planned in the Commissioning Schedule** (6 March 2018 - 20 February 2018 = 14 days); and
  - d) The Project was therefore delayed **an additional 4 calendar days in this time period** (14 days – 10 days = 4 days).
- 7.38 From my review of the contemporaneous documents and the progress achieved during this time, the principal cause(s) of critical delay in this window appear to have been as follows:
- a) Leaks at Valves V-163 and V-167; and
  - b) Weather Delays.

#### ***Leaks at Valves V-163 and V-167***

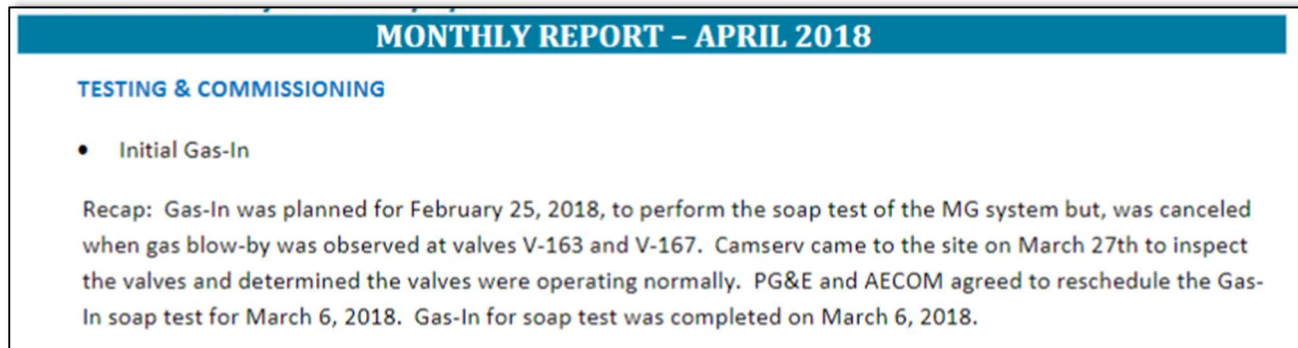
- 7.39 Once PG&E completed the tie-ins at the end of the last window, the Soap test was scheduled for 25 February 2018. However, this was cancelled when a blow-by was observed at valves V-163 & V-167.<sup>284</sup> This delay event is discussed in the excerpt below from AECOM's April 2018 monthly report.<sup>285</sup>

Case #: SO-CV-02387-H2C Document: SS0-3 Filed 04/15/22 Page 114 of 145

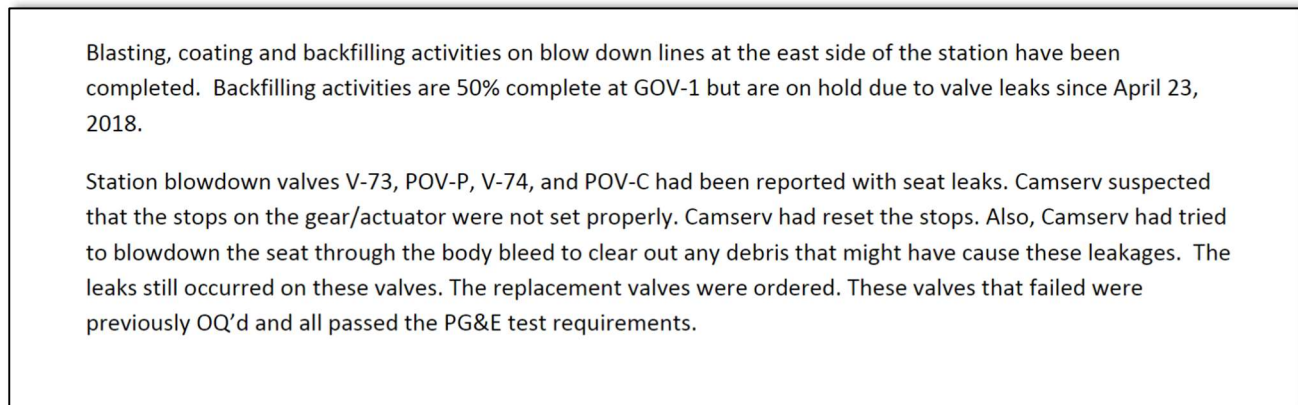
<sup>283</sup> See Commissioning Schedule Activity ID: BCS.920 "Gas In for Soap and Pressure Test"

<sup>284</sup> [BURNEY000079669] AECOM March 2018 monthly report page 3

<sup>285</sup> [BURNEY000377900] AECOM April 2018 monthly report page 23



**Figure 7-6 – AECOM Monthly Report for April 2018<sup>286</sup>**



**Figure 7-8 – AECOM Monthly Report for April 2018<sup>287</sup>**

7.40 As can be seen from the above, Cameron, who is the supplier of the valves, inspected the valves on 27 February 2018 and determined that the valves were operating normally.<sup>288</sup>

7.41 As Cameron was responsible for the quality of the valves, and without any more information, I have attributed the delay to them.

***Weather Delay***

7.42 Although Cameron determined that the valves were operating normally, the Soap test could not immediately proceed due to a forecasted snowstorm. As can be seen in the site progress photo

below, it began snowing on 26 February 2018.

<sup>286</sup> [BURNEY000377900] AECOM April 2018 monthly report page 23

<sup>287</sup> [BURNEY000377901] AECOM April 2018 monthly report page 24

<sup>288</sup> [AEC00610570] See AECOM Delay Event Log



**Figure 7-9 - Site Conditions during February 2018 Snowstorm<sup>289</sup>**

7.43 Both PG&E and AECOM agreed to reschedule the Soap Test until 6 March 2018.

7.44 According to the Project records, the Soap test was successfully performed on 6 March 2018.<sup>290</sup>

### **Conclusion**

7.45 As discussed above, the Soap test was successfully performed on 6 March 2018. Given that the Soap test was planned for 20 February 2018 in the Commissioning Schedule, this work was delayed a total of 14 days (6 March 2018 – 20 February 2018 = 14 days). Considering the 10 days of delay in the previous commissioning window, 4 days were lost during this period of time (14 days – 10 days = 4 days).

7.46 In my opinion, the leaks at valves V-163 and V-167 observed on 25 February 2018 caused 1 day of critical delay to the critical Soap Test. As the valve supplier, Cameron was responsible for the quality of the valves. I have attributed the delay to them.

<sup>289</sup> [BURNEY000371617-BURNEY000371749] See AECOM February 2018 Monthly Report

<sup>290</sup> See As-Built Schedule activity ID BCS.920

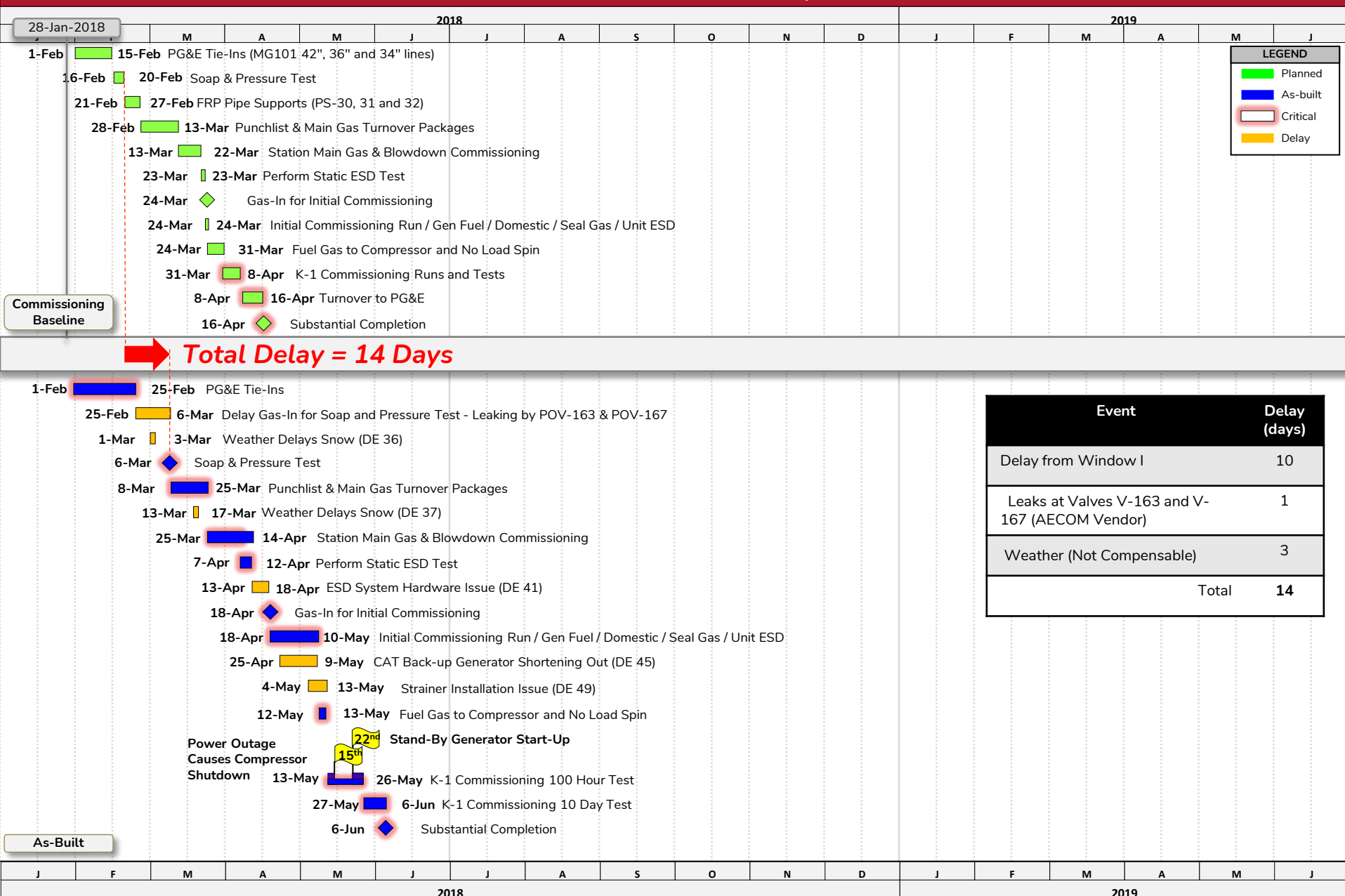
- 7.47 The remaining critical delay of 3 days in this time period is attributed to the snowstorm and it is noted that weather is not compensable under AECOM's contract.
- 7.48 The table below summarizes the actual delay incurred in Window II. The delay during this time period is also illustrated in Figure 7-10 on the following page.

| Phase 3 Window | Cause of Delay                                 | Delay in Window (Days) |
|----------------|--|------------------------|
|                | Delays through Phase 3 Window I                | 10                     |
| II             | Leaks at Valves V-163 and V-167 (AECOM Vendor) | 1                      |
| II             | Weather Delays (Not Compensable)               | 3                      |
|                | <b>Total</b>                                   | <b>14</b>              |

# Burney Compressor Station K-2 Replacement Project

## Phase III Window II – Soap Test

Figure 7-10



### Phase 3 Window III – Turnover of Main Gas (6 Mar 2018 to 7 Apr 2018)

#### ***Introduction***

- 7.49 Once the Soap test was performed, AECOM completed the turnover and punchlist of the main gas line. The turnover packages for the main gas line were required to confirm that the main gas system and controls were ready for commissioning and would allow AECOM to perform the static ESD test.
- 7.50 As it turns out, AECOM's work was again interrupted by weather delays and they were not able to commence the static ESD test until 7 April 2018.
- 7.51 In terms of critical delay in this time window:
- a) At the beginning of this time window (i.e., on 6 March 2018), the Project was 14 calendar days behind the Commissioning Schedule (and a total of 164 calendar days in delay);
  - b) According to the Commissioning Schedule, AECOM planned to perform the Static ESD Test by 23 March 2018;<sup>291</sup>
  - c) AECOM was not able to commence the Static ESD Test until 7 April 2018 – **15 calendar days later than planned in the Commissioning Schedule** (7 April 2018 - 23 March 2018 = 15 days); and
  - d) The Project was therefore delayed **an additional 1 calendar day in this time period** (15 days – 14 days = 1 day).
- 7.52 From my review of the contemporaneous documents and the progress achieved during this time, the principal cause(s) of critical delay in this window appear to have been as follows:

- a) Weather Delay

#### ***Weather Delay***

- 7.53 While the Soap test was completed at the end of the last window, the critical gas turnover activities were impacted by weather delays from 13 March to 17 March 2018.<sup>292</sup>
- 7.54 JH Kelly noted in its daily reports for 14 and 15 March that snow hindered their crews from getting to work on welding the gas tie-ins as shown in the excerpt below.<sup>293</sup>

<sup>291</sup> See Commissioning Schedule Activity ID: COMM-70 "Perform Static ESD test"

<sup>292</sup> [BURNEY000079666-BURNEY000079793] See AECOM March 2018 Monthly Report

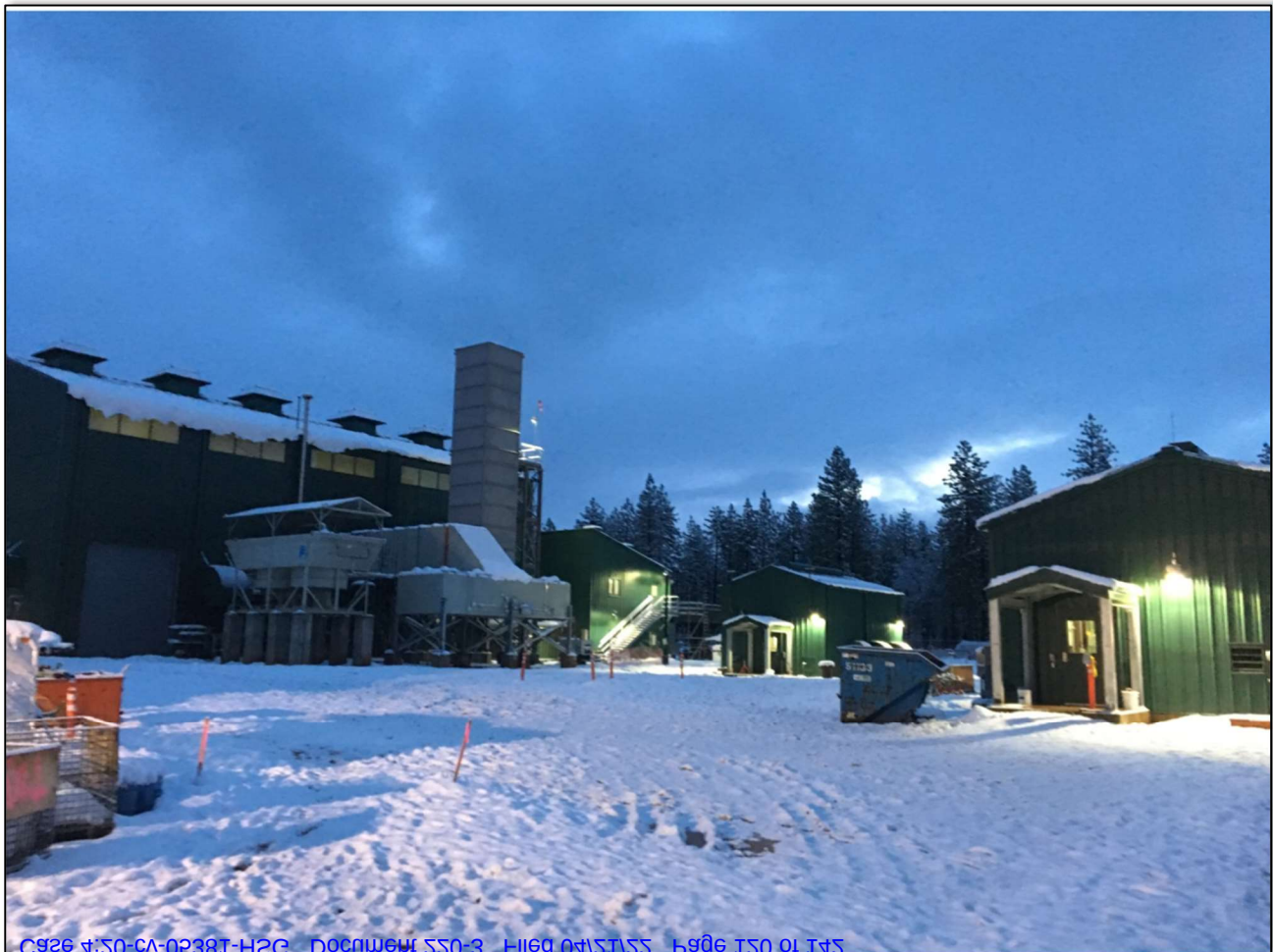
<sup>293</sup> [JHK\_BURNEY\_00160010-JHK\_BURNEY\_00160011 (March 14), JHK\_BURNEY\_00160013-JHK\_BURNEY\_00160014 (March 15)] JH Kelly Daily Report of 14 and 15 March 2018

HINDRANCES TO WORK:

Heavy Rain all day caused the jobsite to become muddy. GC could not perform power gas tie ins due to standing water in the excavations. Coating crews had to relocate due to standing water in excavations.

**Figure 7-11 – JH Kelly Daily report work hindrances on 13 March 2018<sup>294</sup>**

7.55 Additionally, it is noted on 16 and 17 March 2018 that its subcontractors work was shut down due to snow.<sup>295</sup> The weather conditions at the site are shown in AECOM's March 2018 monthly report as excerpted below.<sup>296</sup>



**Figure 7-12 - AECOM Monthly Report Photo dated 20 March 2018<sup>297</sup>**

<sup>294</sup> [JHK\_BURNEY\_00337244-JHK\_BURNEY\_00337245] JH Kelly Daily Report of 13 March 2018

<sup>295</sup> [JHK\_BURNEY\_00160016-JHK\_BURNEY\_00160017 (March 16), JHK\_BURNEY\_00160019-JHK\_BURNEY\_00160020 (March 17)] JH Kelly Daily Report of 16 and 17 March 2018

<sup>296</sup> [BURNEY000079700] AECOM Monthly Report page 35 Progress Photo labeled as of 20 March 2018

<sup>297</sup> [BURNEY000079700] AECOM Monthly Report page 35 Progress Photo labeled as of 20 March 2018

### Conclusion

- 7.56 Given that the static ESD Test was planned to be completed by 23 March 2018, this test was delayed a total of 15 days against the Commissioning Schedule (7 April 2018 - 23 March 2018 = 15 days). Considering the 14 days of delay to the previous commissioning window, 1 day was lost during this time period due to weather (15 days – 14 days = 1 day).
- 7.57 The table below summarizes the actual delay incurred in Window III. It is again noted that weather is not compensable under AECOM's contract. The delay during this time period is also illustrated in Figure 7-13 on the following page.

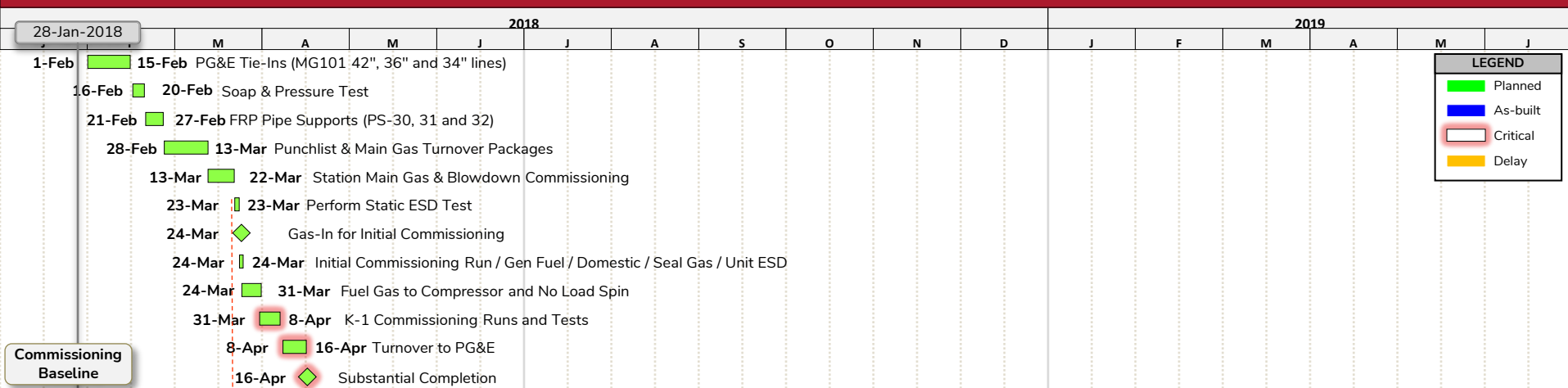
| Phase 3 Window | Cause of Delay                   | Delay in Window (Days) |
|----------------|----------------------------------|------------------------|
|                | Delays through Window II         | 14                     |
| III            | Weather Delays (Not Compensable) | 1                      |
|                | <b>Total</b>                     | <b>15</b>              |

# Burney Compressor Station K-2 Replacement Project

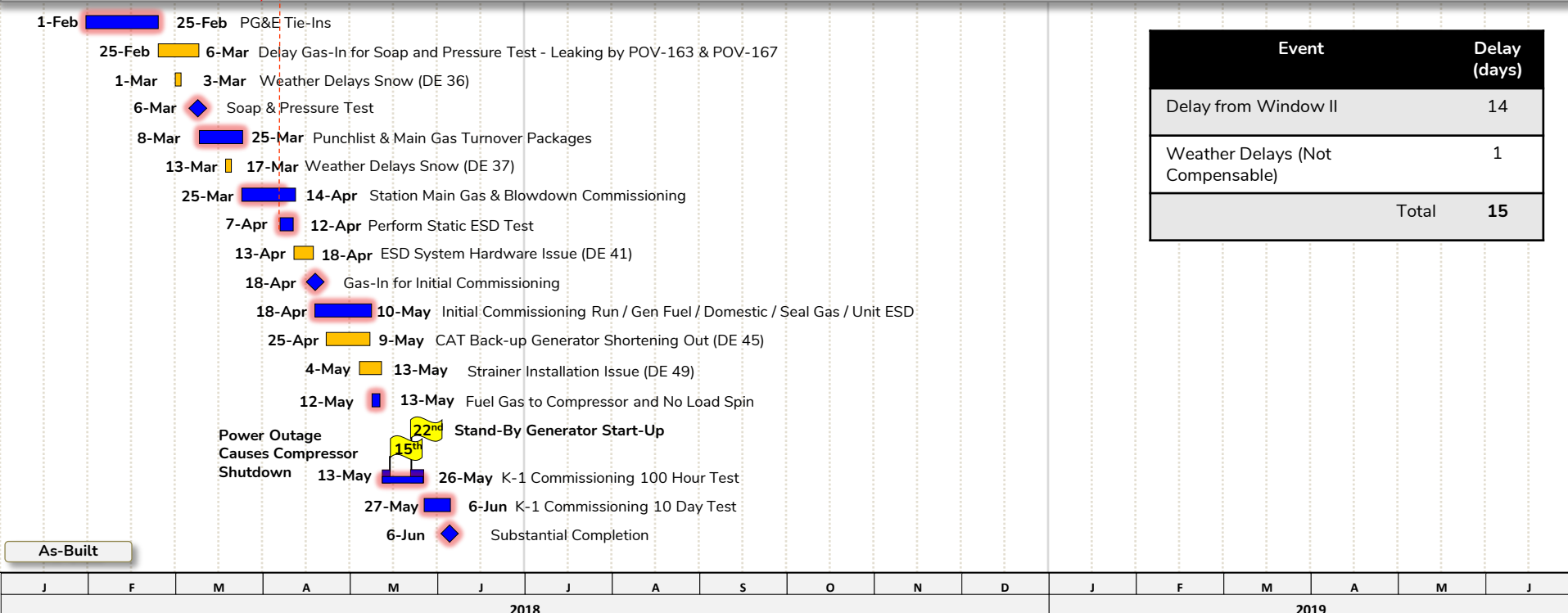
Case 4:20-cv-05381-HSG Document 220-3 Filed 04/21/22 Page 122 of 142

## Phase III Window III – Turnover of Main Gas

Figure 7-13



**Total Delay = 15 Days**



| Event                            | Delay (days) |
|----------------------------------|--------------|
| Delay from Window II             | 14           |
| Weather Delays (Not Compensable) | 1            |
| <b>Total</b>                     | <b>15</b>    |

## Introduction

- ### ***Updated Fire Suppression Program***

- associated with the train recycle and anti-surge valves as shown in the figure below.<sup>301</sup>

<sup>301</sup> [BURNEY000377900] See AECOM April 2018 monthly report page 23

- ESDs

On April 4th, COSCO received the updated fire suppression program and upon testing it on April 5th, there were problems found with the program. The train recycle and anti-surge valves were found to have issues on April 6th. This affected the Gas-In Plan for Saturday, April 7th. On Monday, April 9th, the new program was installed and tested without any problems, making the system ready for pre-commissioning activities related to the ESD system. Both valve issues were resolved on Tuesday the 10th of April. The ESD system testing was completed on April 12, 2018.

**Figure 7-14 - AECOM April 2018 Monthly Report<sup>302</sup>**

7.64 According to the Project records, it was not until 9 April 2018 that the new program was installed with the error corrected.<sup>303</sup>

7.65 Due to the updated fire suppression system, the Static ESD test was not completed until 12 April 2018.<sup>304</sup>

### Conclusion

7.66 As discussed above, the Static ESD test was not completed until 12 April 2018. Given that the Static ESD test was to be completed by 23 March 2018, this work was a total of 20 days in delay against the Commissioning Schedule (12 April 2018 – 23 March 2018 = 20 days). Considering the 15 days of delay to the previous commissioning window, 5 days was lost during this time period.

7.67 In my opinion this delay was due to the updated fire suppression system (20 days – 15 days = 5 days). As COSCO was responsible for the Fire Suppression Program, I have attributed the delay to them.

7.68 The table below summarizes the actual delay incurred in Window IV. The delay during this time period is also illustrated in Figure 7-15 on the following page.

| Phase 3 Window | Cause of Delay                                  | Delay in Window (Days) |
|----------------|---|------------------------|
|                | Delays through Phase 3 Window III               | 15                     |
| IV             | Updated Fire Suppression Program (AECOM Vendor) | 5                      |
|                | <b>Total</b>                                    | <b>20</b>              |

<sup>302</sup> [BURNEY000377900] AECOM April 2018 monthly report page 23

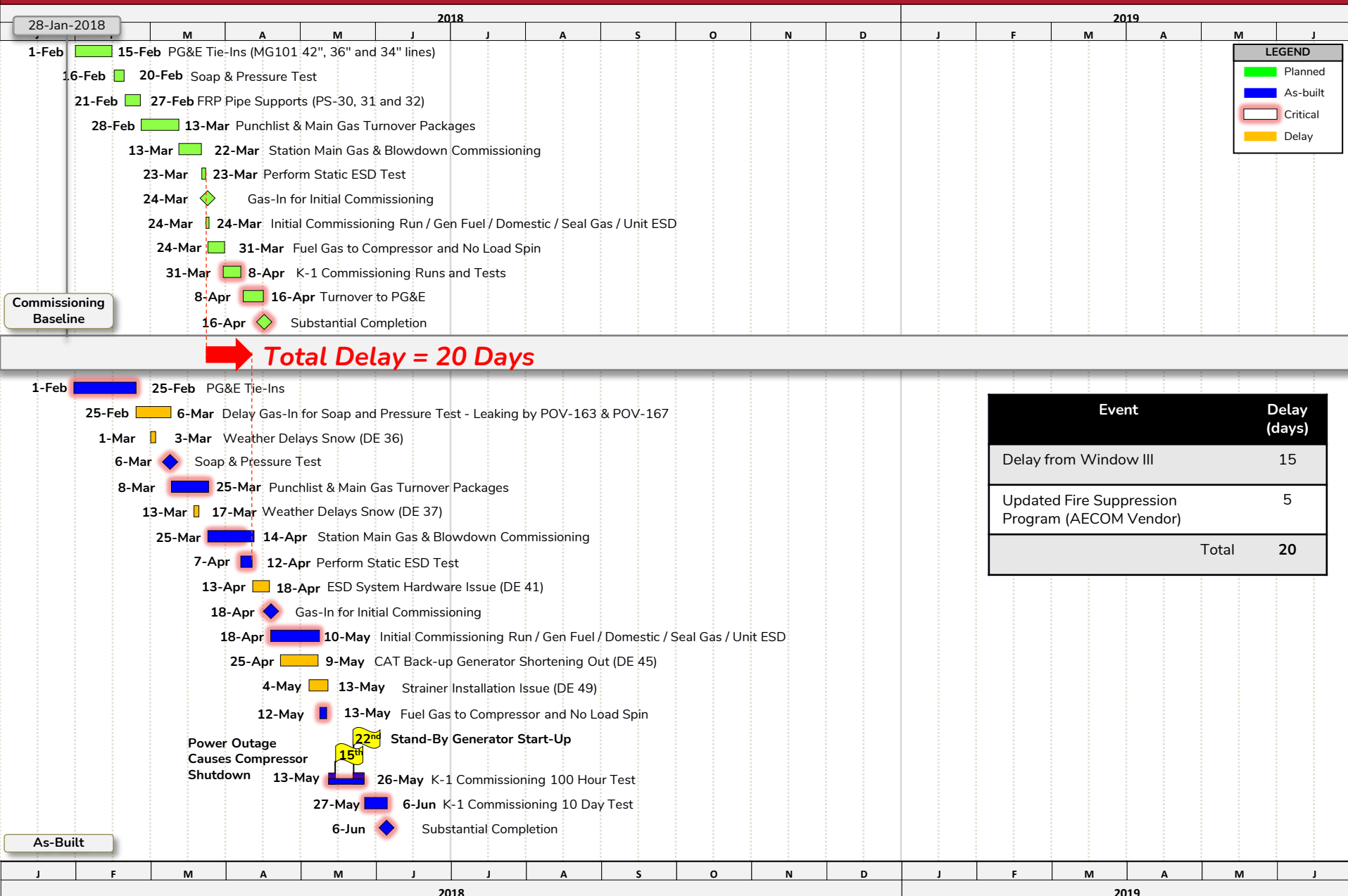
<sup>303</sup> [AEC01064094-AEC01064097] See Commissioning Plan of the Day for 9 April

<sup>304</sup> [BURNEY000377900] See AECOM April 2018 monthly report page 23

# Burney Compressor Station K-2 Replacement Project

## Phase III Window IV – Completion of Static ESD Test

Figure 7-15



### Phase 3 Window V – Gas-In for Initial Commissioning Runs (12 Apr 2018 to 18 Apr 2018)

#### *Introduction*

- 7.69 Once the Static ESD test had been performed, the plant was ready for initial commissioning runs with main gas. However, and as will be discussed, additional hardware issues were identified with the ESD system that consequently delayed Gas-In. Although this issue was not resolved within this window, a mitigation measure was put in place to allow for Gas-In during this time.
- 7.70 In terms of critical delay in this time window:
- a) At the beginning of this time window (i.e., on 12 April 2018), the Project was 20 calendar days behind the Commissioning Schedule (and a total of 170 calendar days in delay);
  - b) According to the Commissioning Schedule, AECOM planned to achieve Gas-In for the initial commissioning runs by 24 March 2018;<sup>305</sup>
  - c) Due to hardware issues, AECOM was not able to get Gas-In for the initial commissioning until 18 April 2018 – **25 calendar days later than planned** in the Commissioning Schedule (18 April 2018 - 24 March 2018 = 25 days); and
  - d) The Project was therefore delayed **an additional 5 calendar days in this time period** (25 days - 20 days = 5 days); and
- 7.71 From my review of the contemporaneous documents and the progress achieved during this time, the principal cause(s) of critical delay in this window appear to have been as follows:
- a) ESD System Hardware Issue

#### *ESD Hardware System Issue*

- 7.72 AECOM planned to bring Gas-In to the station for initial commissioning runs the day after the Static ESD test was completed. This ESD hardware was installed by AECOM's vendor BWDG in March 2018 (well in advance of the gas-in).<sup>306</sup>
- 7.73 However, on 13 April 2017 (the day after the ESD test was completed), AECOM was prevented from bringing Gas-In due to a hardware issue.<sup>307</sup>
- 7.74 As discussed in AECOM's monthly report, this event interrupted the Gas-In commissioning plan as shown in the figure below.

<sup>305</sup> See Commissioning Schedule Activity ID: BCS.290 "Gas In to the Station"

<sup>306</sup> [AEC00118536] See Commissioning Plan of the Day for 6 April 2018 Section B

<sup>307</sup> [AEC00800774-AEC00800777, AEC00800776 (critical issues)] See Commissioning Plan of the Day for 13 April 2018 in critical issues

- ESDs

On April 4th, COSCO received the updated fire suppression program and upon testing it on April 5th, there were problems found with the program. The train recycle and anti-surge valves were found to have issues on April 6th. This affected the Gas-In Plan for Saturday, April 7th. On Monday, April 9th, the new program was installed and tested without any problems, making the system ready for pre-commissioning activities related to the ESD system. Both valve issues were resolved on Tuesday the 10th of April. The ESD system testing was completed on April 12, 2018.

The Gas-In Plan for April 13, 2018 was interrupted, however, by the ESD System receiving a fault signal from the PLC or communication card or some other hardware issue, thus the Gas-In operation was stopped twice by the ESD System, which operated correctly. This ESD shutdown was not due to a mechanical issue, but by a controls or telecommunication malfunction. The Gas-In operation was halted and resumed once the ESD System hardware problem was resolved. The sequence of events were as follows:

- PG&E Operations and commissioning staff were onsite April 14, 2018, to determine if the Gas-In Plan could be resumed.
- Pre-Commissioning activities located the ESD hardware problem, and at 3PM on the 14<sup>th</sup> it was determined the Gas-In Plan could proceed on the next day, April 15, 2018.
- The ESD system discharged the Main Gas system at 2:40AM on the 16<sup>th</sup>. The Pre-Commissioning team again ruled out mechanical failure, and decided there should be no further attempts at Gas-In until further notice.
- In a meeting onsite on April 17, 2018, PG&E's Kris Kaupanger introduced the idea of using a programming "mask" as a temporary fix to avoid any more unnecessary ESDs.
- Gas-In activities were completed on April 20, 2018.
- Gas blow down was required on April 25, 2018, because GOV-1 was leaking. The programming mask remained operable.

**Figure 7-16 - AECOM April 2018 Monthly Report history of ESD hardware system issue<sup>308</sup>**

7.75 These hardware issues persisted and continued to discharge gas during troubleshooting.<sup>309</sup>

7.76 On 17 April 2018, PG&E proposed that a "mask" could be put in place as a temporary mitigation measure to allow for commissioning to proceed.<sup>310</sup>

- Turbine/Compressor Testing

During the first week in April 2018, clearance meetings were held to prepare for introduction of fuel gas to the turbine. On April 13, 2018, gas was introduced to the turbine, but soon thereafter (as noted above), multiple ESDs began to occur due to PLC issues, shutting down gas and initiating station blowdown. Throughout the remainder of April, commissioning and startup were delayed by ongoing equipment and PLC software/programming failures. To continue commissioning activities, a selective programming mask was implemented to override the ESD alarms and resultant station blowdown events. These events prevented Substantial Completion from being achieved on the target date of April 16, 2018.

**Figure 7-17 - AECOM April 2018 Monthly Report "mask" mitigation measure<sup>311</sup>**

<sup>308</sup> [BURNEY000377901] See AECOM April 2018 monthly report page 25

<sup>309</sup> [AEC00785331-AEC00785334] See Commissioning Plan of the Day for 14 April 2018

<sup>310</sup> [BURNEY000377900] See AECOM April 2018 monthly report page 23

<sup>311</sup> [BURNEY000377901] See AECOM April 2018 monthly report page 24

7.77 Gas-In for initial commissioning runs was finally completed on 20 April 2018 with this mitigation “mask” in place.<sup>312</sup>

7.78 However, it is noted that the ESD hardware system issue persisted as shown in the figure below.

| IV. CRITICAL ISSUES |   |
|---------------------|---|
| 1.                  | Sunday April 29 at 1:46 am Station went into ESD due to PLC communication fault at RSCP-6. Needs further investigation by PG&E and BWDG to determine what the underlying source for system communication faults is. |
| 2.                  | GOV-1 still leaks after seal replacement when there is differential across the valve. AECOM to contact Cameron re: what has been discovered during commissioning and secondary seal replacement.                    |
| 3.                  | Generator cannot be commissioned until new harness is received and new reg station that is stable is installed.   |

Figure 7-18 - Commissioning Daily Report of 30 April 2018<sup>313</sup>

### Conclusion

7.79 As discussed above, Gas-In for initial commissioning runs was finally completed on 20 April 2018. Given that the Gas-In milestone was planned to be achieved on 24 March 2018, the Gas-in for commissioning was 25 days in delay at this point in time (18 April 2018 – 24 March 2018 = 25 days). Considering the 20 days of delay to the previous commissioning window, 5 days was lost during this time period.

7.80 In my opinion, this delay was due to the ESD Hardware System Issue (25 days – 20 days = 5 days). As BWDG was responsible for the hardware, I have attributed the delay to them.

7.81 The table below summarizes the actual delay incurred in Window V. The delay during this time period is also illustrated in Figure 7-19 on the following page.

| Phase 3 Window | Cause of Delay                           | Delay in Window (Days) |
|----------------|--|------------------------|
|                | Delays through Phase 3 Window IV         | 20                     |
| V              | ESD hardware System Issue (AECOM Vendor) | 5                      |
| Total          |  | 25                     |

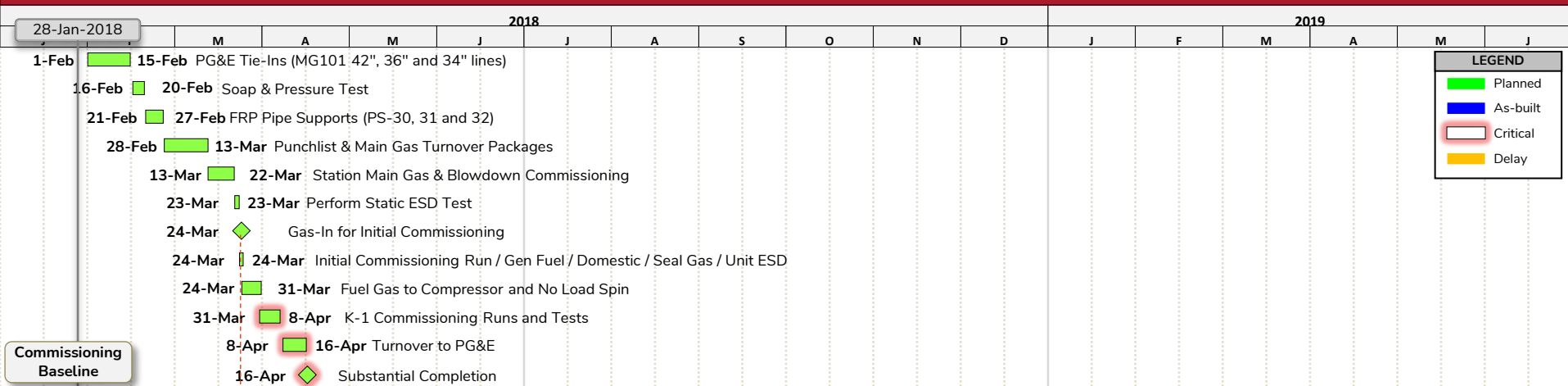
<sup>312</sup> [BURNEY000377900] See AECOM April 2018 monthly report page 23

<sup>313</sup> [AEC00144791] See Commissioning Plan of the Day for 30 April 2018 Section IV

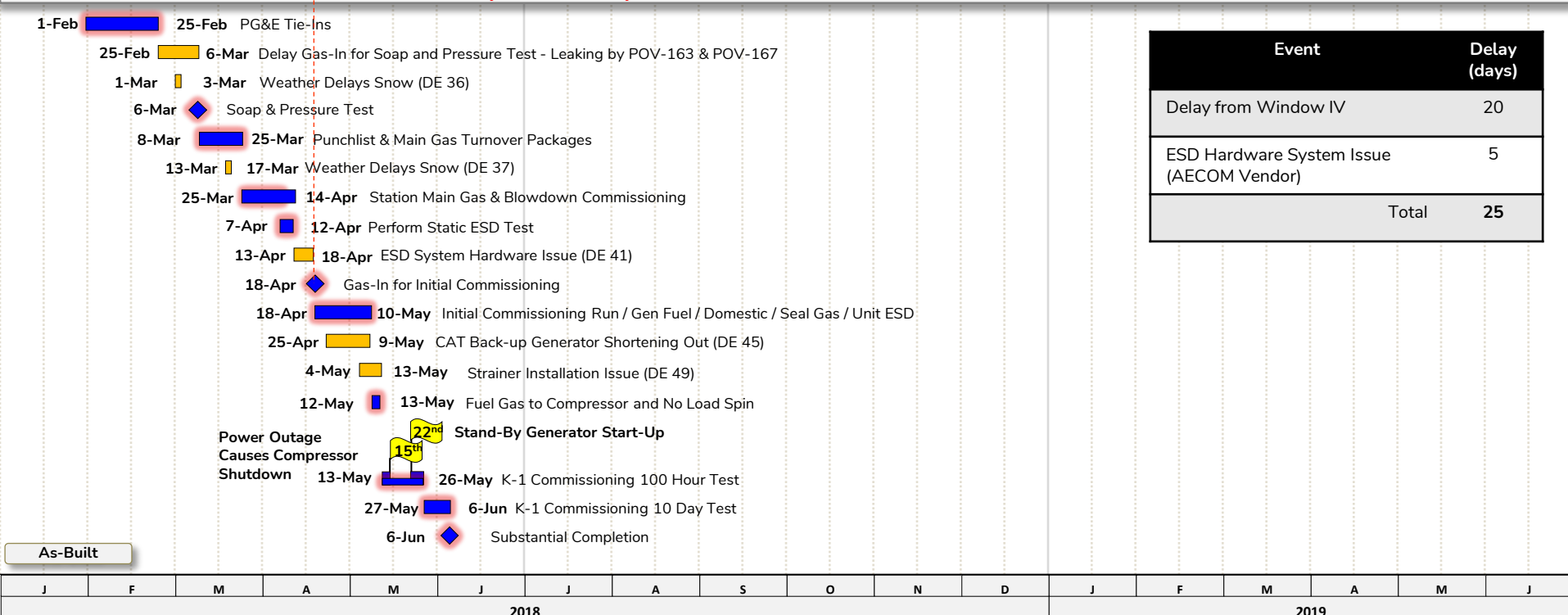
# Burney Compressor Station K-2 Replacement Project

## Phase III Window V – Gas-In for Initial Commissioning Runs

Figure 7-19



**Total Delay = 25 Days**



### Phase 3 Window VI –Initial Commissioning Runs (18 Apr 2018 to 13 May 2018)

#### *Introduction*

- 7.82 Once the ESD “mask” was put in place, AECOM could bring gas into the station and commence the initial commissioning runs.
- 7.83 As it turns out, shortly after gas was brought into the station during the initial commissioning runs, AECOM encountered issues with the standby generator and the strainer, which prevented AECOM from commencing the 100-hour test until 13 May 2018.<sup>314</sup>
- 7.84 In terms of critical delay in this time window:
- a) At the beginning of this time window (i.e., on 18 April 2018), the Project was 25 calendar days behind schedule (and a total of 175 calendar days in delay);
  - b) According to the Commissioning Schedule, AECOM planned to commence commissioning runs by 31 March 2018;<sup>315</sup>
  - c) AECOM was not able to commence the 100-hour test until 13 May 2018 – **43 calendar days later than planned** (13 May 2018 - 31 March 2018 = 43 days); and
  - d) The Project was therefore delayed an **additional 18 calendar days in this time period** (43 days - 25 days = 18 days).
- 7.85 From my review of the contemporaneous documents and the progress achieved during this time, the principal cause(s) of critical delay in this window appear to have been as follows:
- a) CAT Stand-By Generator Wire Harness; and
  - b) Strainer Installation Issue.

#### ***CAT Stand-By Generator Wire Harness***

- 7.86 On 25 April 2018, the CAT Stand-By Generator was started up for testing. During start-up, the wire harness was found to be smoking and damaged due to cross connected conductors which were installed by AECM’s vendor, Peterson.<sup>316</sup>

<sup>314</sup> [AEC00467730-AEC00467733, AEC00467731 (sect K)] See Commissioning Plan of the Day for 13 May 2018 section K

<sup>315</sup> See Commissioning Schedule Activity ID: COMM-73 “Gas in for Initial Commissioning Run / Gen Fuel / Domestic / Seal Gas / Unit Gas / Unit ESD”

<sup>316</sup> [AEC00472251-AEC00472254, BURNEY000377904] See Commissioning Plan of the Day for 26 April and AECOM April 2018 monthly report page 27

7.87 Peterson, informed AECOM that a new harness could arrive in 2 weeks and proposed that a temporary wire harness be used for commissioning in the interim.<sup>317</sup>

7.88 On 30 April 2018, PG&E decided that AECOM could proceed with the 100-hour test without the standby generator as shown below.<sup>318</sup>

On April 25th, shortly after the vendor rep started the CAT standby generator for testing and commissioning activities, the wire harness was observed to be smoking. Commissioning activities were stopped immediately. Preliminary information about the availability of a new wire harness from Peterson was that it would be a two week delivery. Peterson proposed a temporary wire harness be made until the required wire harness was received. This plan was approved.

The Standby Generator was required to be operational to proceed with the 100-hour turbine testing in case there was a power outage. On April 30, 2018, PG&E asked for a firm delivery date for the replacement harness from Peterson so the project team could plan accordingly to be able to understand what to expect once the Solar Unit 100-hour run was completed. However, PG&E ultimately decided to proceed with the turbine testing without standby power.

**Figure 7-20 - AECOM April 2018 Monthly Report and PG&E confirmation to proceed with testing<sup>319</sup>**

7.89 The installation of the temporary wire harness was completed by 9 May 2018 and the 100-hour test was performed with this temporary repair.<sup>320</sup>

7.90 However, it is noted that AECOM still needed to eventually install a permanent harness as can be seen in the commissioning daily report below.<sup>321</sup>

**C. Standby Generator Package**

- 1. Complete installation replacement wiring to replace genset harness damaged by cross-connected conductors.**
2. Weld in new piping configuration for new regs.
- 3. Install reliable fuel gas regulation.**
4. Start-up Unit and load test.
5. Follow load test with transfer test.

**Figure 7-31 - Commissioning Daily Report for 11 May 2018 after temporary wire harness installation<sup>322</sup>**

CASE 4:50-cv-02381-HSC Document 550-3 Filed 04/15/22 Page 131 of 145

<sup>317</sup> [BURNEY000377901] See AECOM April 2018 monthly report page 24

<sup>318</sup> [BURNEY000377901] See AECOM April 2018 monthly report page 24

<sup>319</sup> [BURNEY000377901] See AECOM April 2018 monthly report page 24

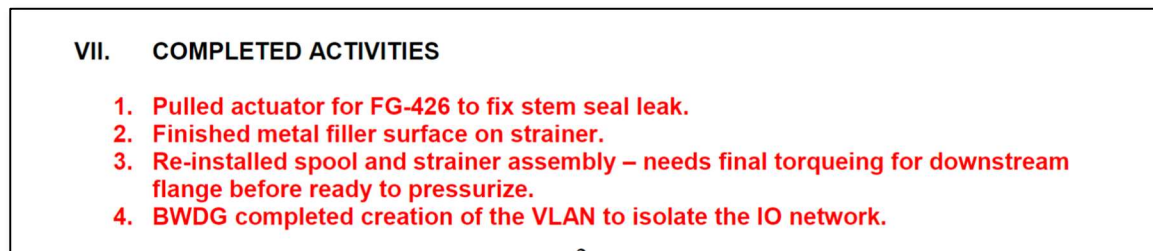
<sup>320</sup> [AEC00437448-AEC00437451, AEC00437448 (sect C)] See Commissioning Plan of the Day for 9 May 2018 section C

<sup>321</sup> [AEC00231746] See Commissioning Plan of the Day for 11 May 2018 section C

<sup>322</sup> [AEC00428325-AEC00428325, AEC00428325-AEC00428326 (sect K)] See Commissioning Plan of the Day for 11 May 2018 Section C

### ***Strainer Installation Issue***

- 7.91 Concurrent with the Stand-By Generator harness issue, problems were encountered during the cleaning of the strainer. The strainer is designed to catch debris in the pipe spool to avoid potentially damaging equipment.
- 7.92 The strainer was removed by JH Kelly on 4 May 2018 to de-clog debris.<sup>323</sup> It is my understanding that this debris could have come from any party but nonetheless this strainer would have always needed to be accessible for cleaning as part of routine maintenance.<sup>324</sup>
- 7.93 Once the strainer was removed for cleaning, it was damaged during re-installation on 6 May 2018 by JH Kelly.<sup>325</sup> It is my understanding that this damage was caused because there was not enough clearance for the strainer as the pipe spool shifted at some point between initial construction and 6 May 2018.<sup>326</sup>
- 7.94 As JH Kelly caused the damage to the strainer, I have attributable the delay to them.
- 7.95 I note that AECOM contemporaneously noted in its Commissioning Plan of the Day that the strainer was difficult to repair and was on the critical path to start the compressor.<sup>327</sup>
- 7.96 The strainer was repaired and re-installed on 11 May 2018 as can be seen in the commissioning daily report below.<sup>328</sup>



**Figure 7-22 - Commissioning Daily Report for 11 May 2018 after strainer re-installation<sup>329</sup>**

C926 4:50-CA-0238J-H2C DOCUMENT 550-3 E1169 04/5/155 6906 J35 01 J45

<sup>323</sup> [AEC00318584-AEC00318587, AEC00318584-AEC00318585 (sect K), AEC00318585 (sect VII)] See Commissioning Plan of the Day for 4 May 2018 section K and VII

<sup>324</sup> [AEC00610570] AECOM delay event log

<sup>325</sup> [AEC00359932-AEC00359935 (5-7-18), AEC00340345-AEC00340348 (5-6-18)] See Commissioning Plan of the Day for 7 May 2018 section K and Commissioning Plan of the Day for 6 May 2018 section V

<sup>326</sup> [AEC00610570] AECOM delay event log

<sup>327</sup> [BURNEY000377902] See AECOM April 2018 monthly report page 25

<sup>328</sup> [AEC00428325-AEC00428325, AEC00428325-AEC00428326 (sect K)] See Commissioning Plan of the Day for 11 May 2018 section K

<sup>329</sup> [AEC00428325-AEC00428325, AEC00428325-AEC00428326 (sect K)] See Commissioning Plan of the Day for 11 May 2018 Section VII

7.97 On 13 May 2018 the Compressor was started up and AECOM was able to commence the 100-hour test.<sup>330</sup>

### **Conclusion**

7.98 As discussed above, AECOM was able to commence the 100-hour test on 13 May 2018. Given that the Compressor commissioning was planned to commence on 31 March 2018, this work was 43 days later than planned in the Commissioning Schedule (13 May 2018 - 31 March 2018 = 43 days). Considering the 25 days of delay to the previous commissioning window, 18 days was lost during this time period (43 days – 25 days = 18 days).

7.99 As discussed above, the CAT Stand-By Generator Harness was damaged upon start-up on 25 April 2018 and was the sole cause of delay for 9 days until 4 May 2018 (4 May 2018 – 25 April 2018 = 9 days). This 9-day delay is attributable to AECOM's vendor, Peterson.

7.100 As also discussed above, the Strainer was damaged on 4 May 2018 and was the sole cause of the 9-day delay to the start of initial commissioning runs until 13 May 2018 (13 May 2018 - 4 May 2018 = 9 days). This 9-day delay is attributable to JH Kelly.

7.101 The table below summarizes the actual delay incurred in Window VI. The delay during this time period is also illustrated in Figure 7-23 on the following page.

| Phase 3 Window | Cause of Delay                                     | Delay in Window (Days) |
|----------------|--|------------------------|
|                | Delays through Phase 3 Window V                    | 25                     |
| VI             | CAT Stand-By Generator Wire Harness (AECOM Vendor) | 9                      |
| VI             | Strainer Installation Issue (JH Kelly)             | 9                      |
|                | <b>Total</b>                                       | <b>43</b>              |

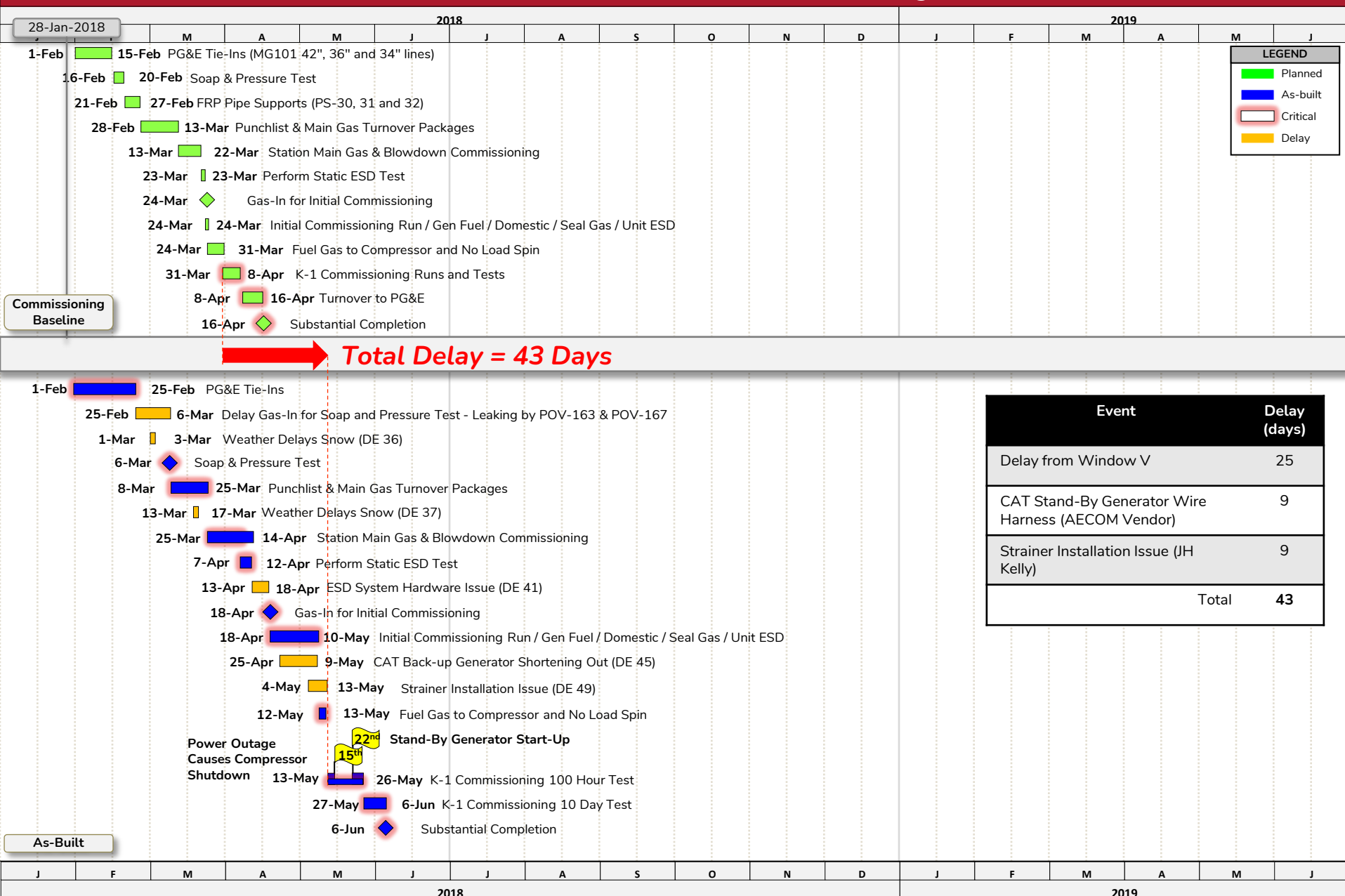
Case 4:20-cv-02381-HSC Document 550-3 Filed 04/15/25 Page 133 of 145

<sup>330</sup> [AEC00467730-AEC00467733, AEC00467731 (sect K)] See Commissioning Plan of the Day for 13 May 2018 section K

# Burney Compressor Station K-2 Replacement Project

## Phase III Window VI – Initial Commissioning Runs

Figure 7-23



**Phase 3 Window VII –Completion of 100-Hour Test (13 May 2018 to 26 May 2018)*****Introduction***

7.102 AECOM commenced the 100-hour test during the last window with several mitigation measures in place such as the ESD Mask and without a commissioned Stand-By Generator. PG&E accepted this risk on 30 April 2018.

7.103 However, and as will be discussed, PG&E reversed this decision and AECOM was required to re-start the 100-hour test.

7.104 In terms of critical delay in this time window:

- a) At the beginning of this time window (i.e., on 13 May 2018), the Project was 44 calendar days behind schedule (and a total of 193 calendar days in delay);
- b) According to the Commissioning Schedule, AECOM planned to have the first 100 hours of Compressor commissioning completed by 4 April 2018;<sup>331</sup>
- c) AECOM was not able to complete the 100-hour test until 26 May 2018 – **52 calendar days later than planned** (26 May 2018 - 4 April 2018 = 52 days); and
- d) The Project was therefore delayed an **additional 9 calendar days in this time period** (52 days - 43 days = 9 days).

7.105 From my review of the contemporaneous documents and the progress achieved during this time, the principal cause(s) of critical delay in this window appear to have been as follows:

- a) CAT Stand-By Generator; and
- b) Power Outage.

***CAT Stand-By Generator Regulator***

7.106 As discussed in the previous window, on 25 April 2018, the CAT Stand-By Generator was started up for testing and commissioning activities and the wire harness was found to be smoking. Also, during the start-up of the Stand-By Generator, the fuel gas regulator was found to not be operating as expected.<sup>332</sup>

---

<sup>331</sup> See Commissioning Schedule Activity ID: COMM-78 “K-1 Commissioning Runs and Tests

<sup>332</sup> [BURNEY000377902] See AECOM April 2018 monthly report page 25

7.107 On 26 April 2018, the commissioning team determined that a design change needed to be made for the Stand-By Generator and a new regulator was needed.<sup>333</sup>

7.108 AECOM's vendor, Peterson, estimated that the new regulator would arrive on 11 May 2018.

7.109 However, as it turns out, the regulator did not arrive on site until 15 May 2018 and was not installed until 18 May 2018.

### ***Power Outage***

7.110 As discussed in AECOM's April 2018 monthly report (shown below), PG&E accepted the risk of commencing the 100-hour test of the Compressor/Turbine without the Stand-By Generator as a mitigation measure. This decision was made on 30 April 2018 when both the regulator and wire harness issues were known.

The Standby Generator was required to be operational to proceed with the 100-hour turbine testing in case there was a power outage. On April 30, 2018, PG&E asked for a firm delivery date for the replacement harness from Peterson so the project team could plan accordingly to be able to understand what to expect once the Solar Unit 100-hour run was completed. However, PG&E ultimately decided to proceed with the turbine testing without standby power.

**Figure 7-24 – AECOM monthly report for April 2018<sup>334</sup>**

7.111 Unfortunately, after commencing the 100-hour test, there was a power outage event at the Project site on 15 May 2018.<sup>335</sup>

7.112 As a result of the outage, and as can be seen in the commissioning report below, PG&E advised AECOM that it would not accept the risk of continuing the Compressor/Turbine commissioning without backup power (in the event of another power outage). On 17 May 2018, PG&E instructed AECOM to re-start the 100-hour test once the Stand-By Generator was commissioned.<sup>336</sup>

Case 4:20-cv-02381-HSC Document 550-3 Filed 04/15/25 Page 136 of 145

<sup>333</sup> [AEC00472251-AEC00472254, AEC00472251 (sect G)] See Commissioning Plan of the Day for 26 April 2018 section G

<sup>334</sup> [BURNEY000377901] AECOM April 2018 monthly report page 24

<sup>335</sup> [AEC00329747-AEC00329750, AEC00329747 (sect VII)] See Commissioning Plan of the Day for 16 May 2018 section VII

<sup>336</sup> [AEC00281853-AEC00281856, AEC00281853 (sect VII)] See Commissioning Plan of the Day for 17 May 2018 section VII

**VII. COMPLETED ACTIVITIES**

1. Fitted & welded in new genset regulation piping – MT performed.
2. Determined new running schedule and constraints given conditions that occurred during May 15 power outage(s) – run Unit after genset is commissioned.
3. Alpine Power in to perform UPS battery capacity discharge test (re-test due to power failure).
4. Re-set air compressor auto-start after power failure configuration to 15 seconds.

**Figure 7-25 – Commissioning Daily Report for 17 May 2018 after instruction to re-test<sup>337</sup>**

7.113 As discussed above, the regulator for the Stand-By Generator was installed on 18 May 2018. Once the new regulator was installed, AECOM was able to start up the Stand-By generator on 22 May 2018.<sup>338</sup>

7.114 The 100-hour test of the Turbine/Compressor was re-started on 22 May 2018 and completed by 26 May 2018.<sup>339</sup>

**Conclusion**

7.115 As discussed above, the 100-hour test of the Turbine/Compressor was not completed until 26 May 2018. Given that the 100-Hour Test was planned to commence on 4 April 2018, this work was 52 days later than planned in the Commissioning Schedule (26 May 2018 - 4 April 2018 = 52 days). Considering the 43 days of delay to the previous commissioning window, 9 days was lost during this time period due to the delay events discussed above (52 days – 43 days = 9 days).

7.116 The 9-day delay is attributable to AECOM, as the initial plan was to complete the 100-hour test with the Stand-By Generator (even though PGE& initially allowed AECOM to proceed without it).

7.117 The table below summarizes the actual delay incurred in Window VII. The delay during this time period is also illustrated in Figure 7-26 on the following page.

Case 4:20-cv-02381-HSC Document 550-3 Filed 04/15/25 Page 131 of 145

<sup>337</sup> [AEC00281853-AEC00281856, AEC00281853 (sect VII)] See Commissioning Plan of the Day for 17 May 2018 section VII Item 3

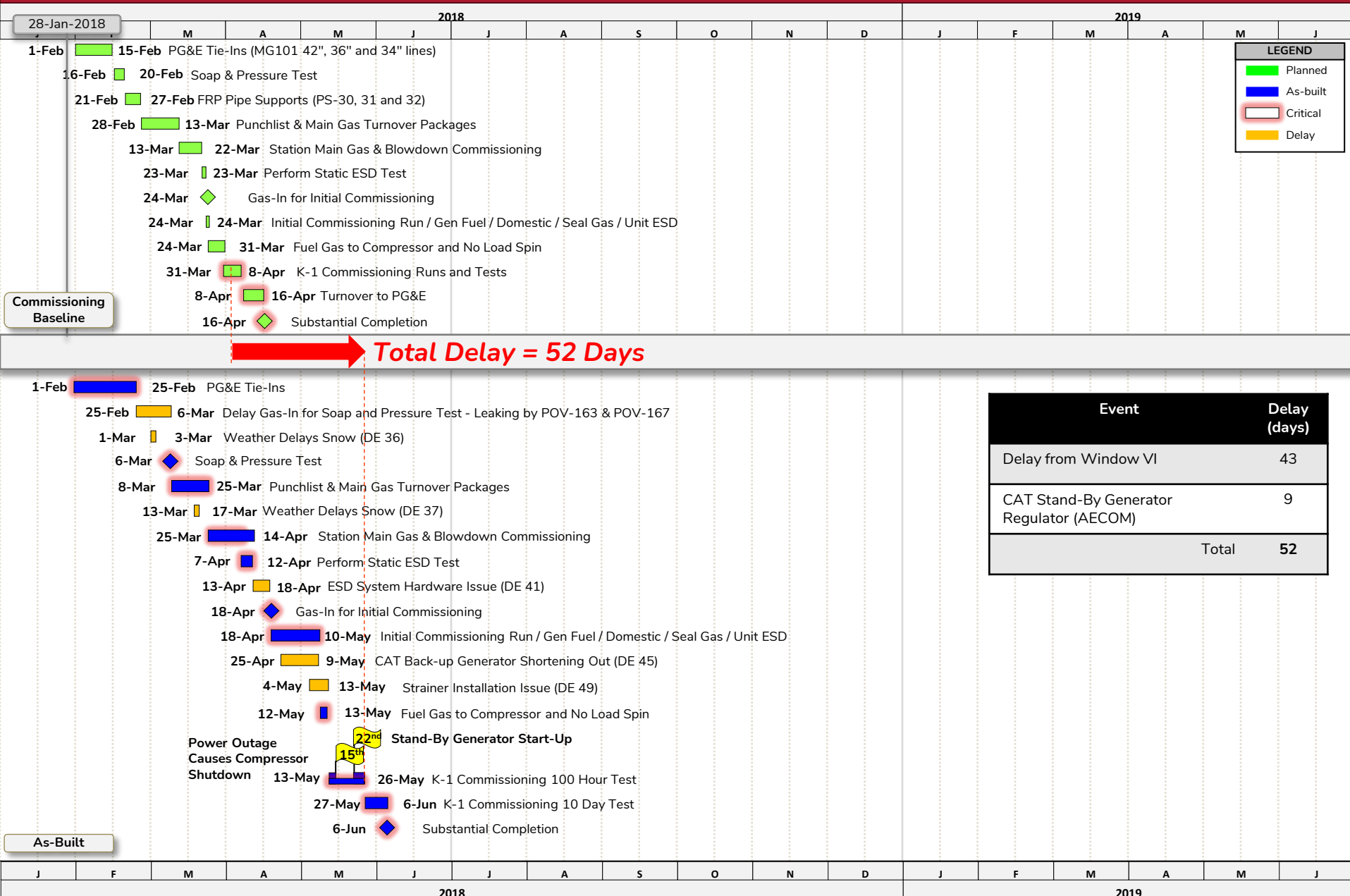
<sup>338</sup> [AEC00373571-AEC00373573, AEC00373571 (sect C)] See Commissioning Plan of the Day for 22 May 2018 section C

<sup>339</sup> [AEC00323400-AEC00323402, AEC00323400 (sect VII)] See Commissioning Plan of the Day for 26 May 2018 section VII

| Phase 3 Window | Cause of Delay                           | Delay in Window (Days) |
|----------------|--|------------------------|
|                | Delays through Phase 3 Window VI         | 43                     |
| VII            | CAT Stand-By Generator Regulator (AECOM) | 9                      |
|                | <b>Total</b>                             | <b>52</b>              |

## Phase III Window VII – 100-Hour Test

Figure 7-26



### Phase 3 Window VIII – Substantial Completion (26 May 2018 to 6 Jun 2018)

#### **Introduction**

7.118 As previously discussed, AECOM planned to complete the 100-hour and 10-day tests concurrently in the Commissioning Schedule. AECOM then planned for an 8-day period to allow for turnover to PG&E prior to achieving Substantial Completion.

7.119 In terms of critical delay in this time window:

- a) At the beginning of this time window (i.e., on 26 May 2018), the Project was 52 calendar days behind schedule (and a total of 204 calendar days in delay);
- b) According to Commissioning Schedule, AECOM planned to achieve Substantial Completion by 16 April 2018;<sup>340</sup>
- c) AECOM completed the 10-day test and achieved Substantial Completion on 6 June 2018<sup>341</sup> – **51 calendar days later than planned** (6 June 2018 - 16 April 2018 = 51 days); and
- d) The Project actually **made up 1 day of delay in the time period** (52 days – 51 days = 1 day); and

7.120 As discussed above, AECOM commenced the 10-day test immediately after completing the 100-hour test and achieved substantial completion on 6 June 2018, thus they were able to make up 1 day of delay).<sup>342</sup>

#### **Conclusion**

7.121 The table below summarizes the actual delay incurred in Window VIII. The Contractor's performance during this time period is also illustrated in Figure 7-27 on the following page.

| Phase 3 Window | Cause of Delay                    | Delay in Window (Days) |
|----------------|-----------------------------------|------------------------|
|                | Delays through Phase 3 Window VII | 52                     |
| VIII           | Mitigation                        | -1                     |
| Total          |                                   | 51                     |

<sup>340</sup> See Commissioning Schedule Activity ID: BCS.270 "Substantial Completion (functional for its intended use)"

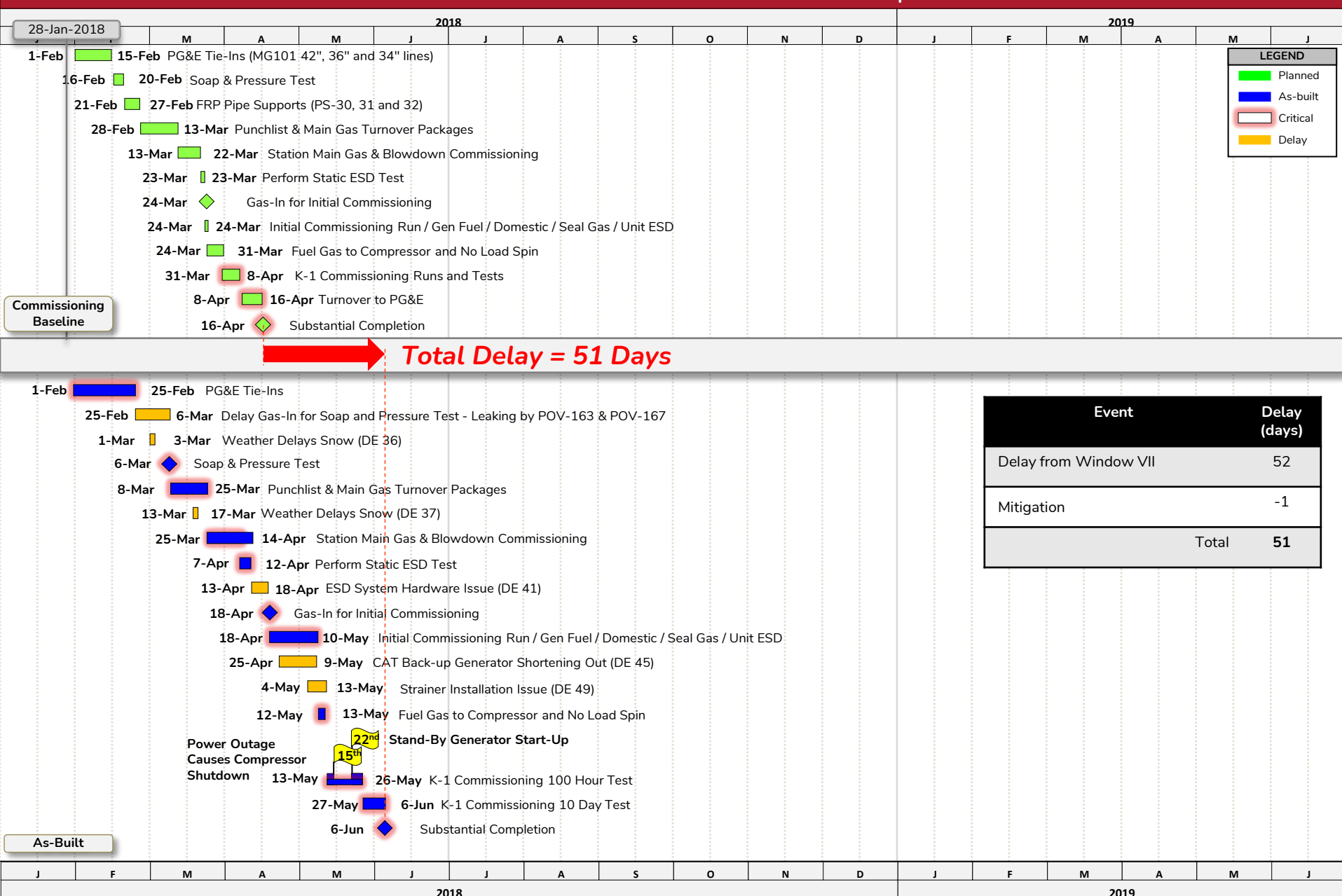
<sup>341</sup> [BURNEY000177366-BURNEY000177369] AECOM Letter from Don Divers to PG&E dated 13 June 2018

<sup>342</sup> [AEC00188937-AEC00188939] See AECOM Letter dated 26 June 2018

# Burney Compressor Station K-2 Replacement Project

## Phase III Window VIII – Substantial Completion

Figure 7-27



### Conclusion of Analysis for Commissioning and Substantial Completion

7.122 As discussed above, at the end of the Construction period (i.e., 2 February 2018 and through Window VI), the Project was 150 calendar days behind schedule. An additional 51 days of delay were incurred during the commissioning for Substantial Completion which was achieved on 6 June 2018 – 201 days late. This delay can be seen in the table below.

| Window       | Delay Description                | PG&E      | JHK       | AECOM    | AECOM Vendors | Exc. Non-Comp | Cumulative Delay |
|--------------|----------------------------------|-----------|-----------|----------|---------------|---------------|------------------|
| Phase 2 I-IV | Construction                     | 77        | 61        | 0        | 0             | 12            | 150              |
| I            | PG&E tie-ins                     | 10        | 0         | 0        | 0             | 0             | 160              |
| II           | Leaks at Valves V-163 and V-167  | 0         | 0         | 0        | 1             | 0             | 161              |
| II           | Weather                          | 0         | 0         | 0        | 0             | 3             | 164              |
| III          | Weather                          | 0         | 0         | 0        | 0             | 1             | 165              |
| IV           | Updated Fire Suppression Program | 0         | 0         | 0        | 5             | 0             | 170              |
| V            | ESD Hardware System Issue        | 0         | 0         | 0        | 5             | 0             | 175              |
| VI           | CAT Stand-By Generator           | 0         | 0         | 0        | 9             | 0             | 184              |
| VI           | Strainer Installation Issue      | 0         | 9         | 0        | 0             | 0             | 193              |
| VII          | CAT Stand-By Generator Regulator | 0         | 0         | 9        | 0             | 0             | 202              |
| VIII         | Substantial Completion           | 0         | 0         | -1       | 0             | 0             | 201              |
| <b>Total</b> |                                  | <b>87</b> | <b>70</b> | <b>8</b> | <b>32</b>     | <b>16</b>     | <b>201</b>       |